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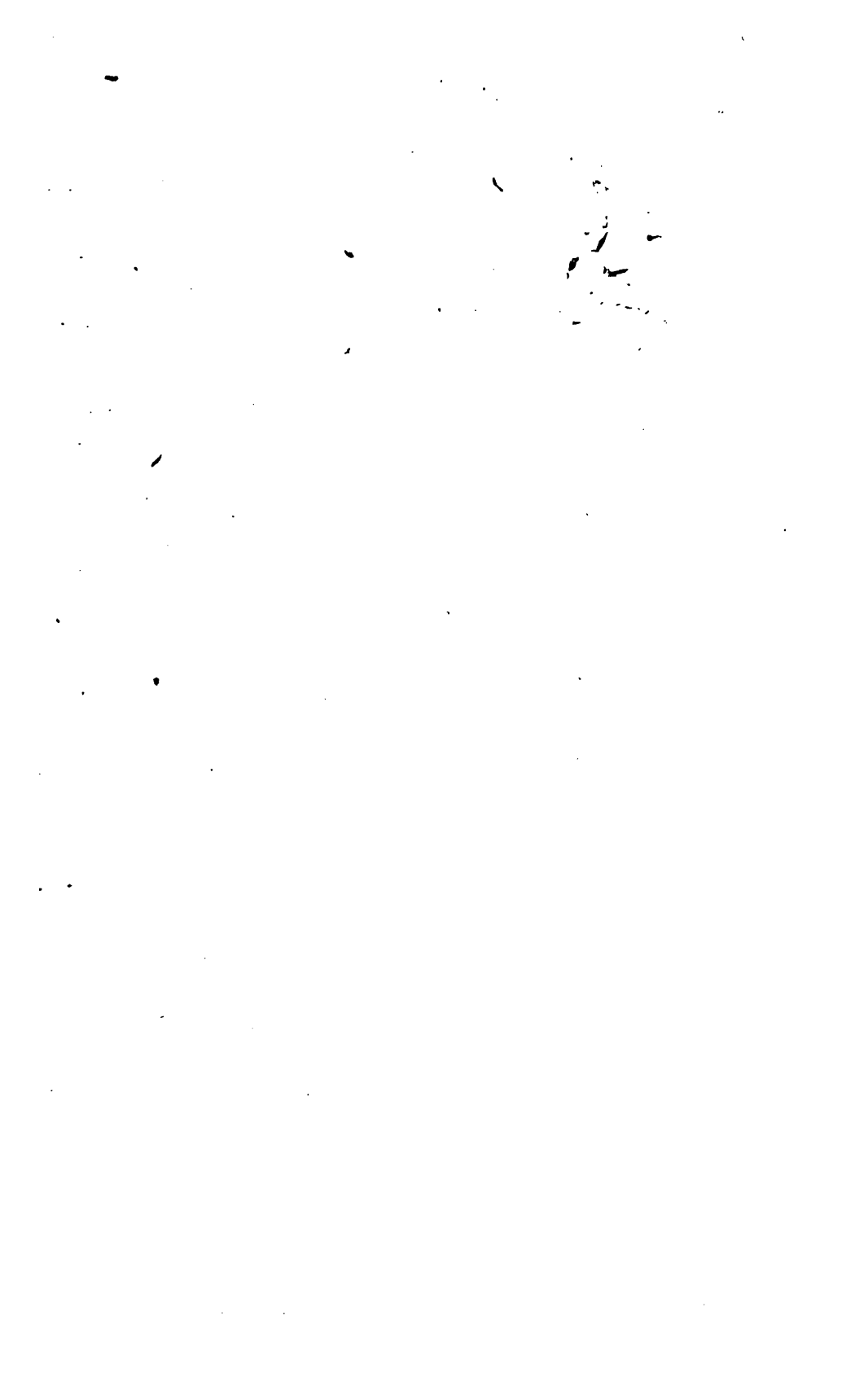
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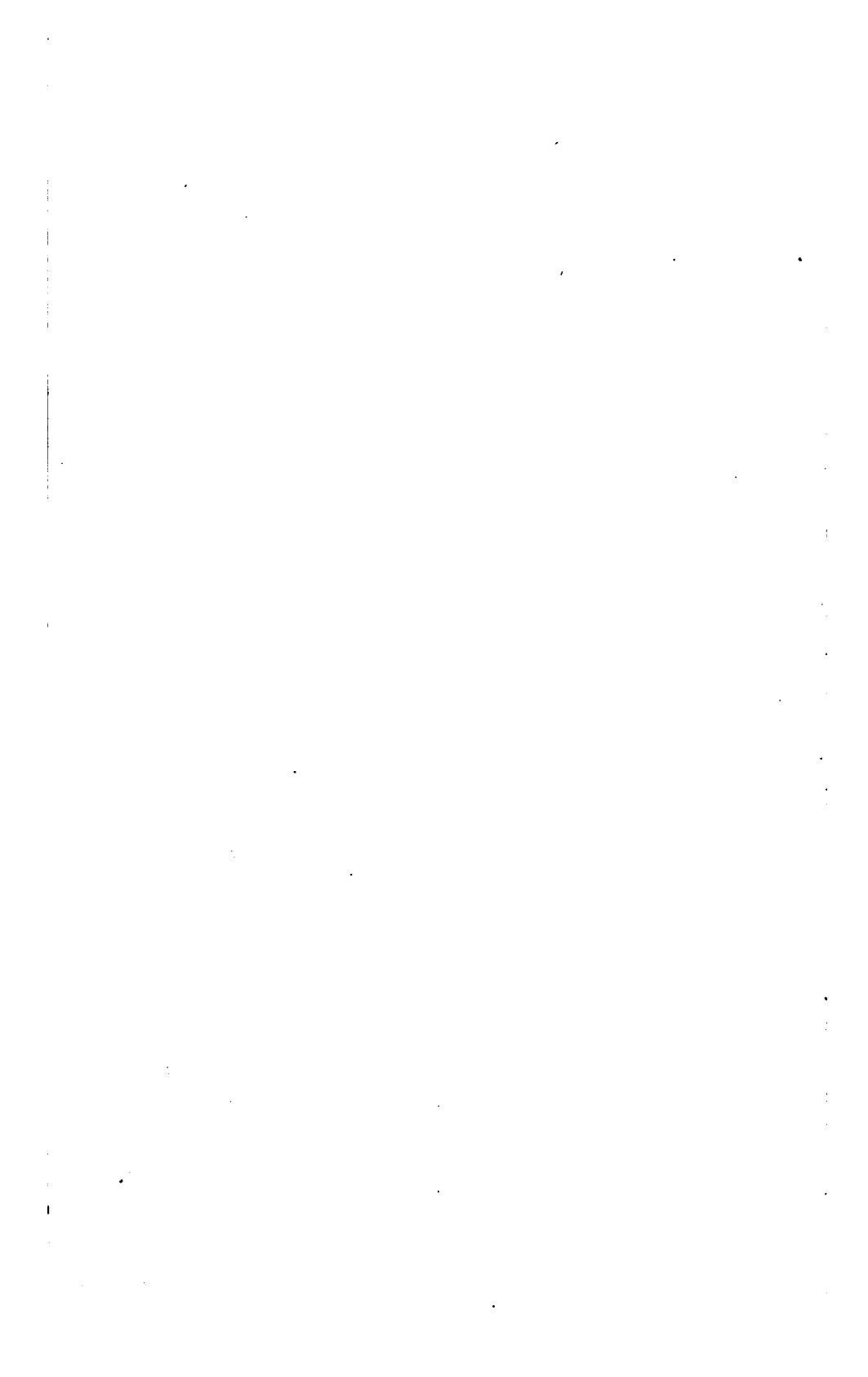


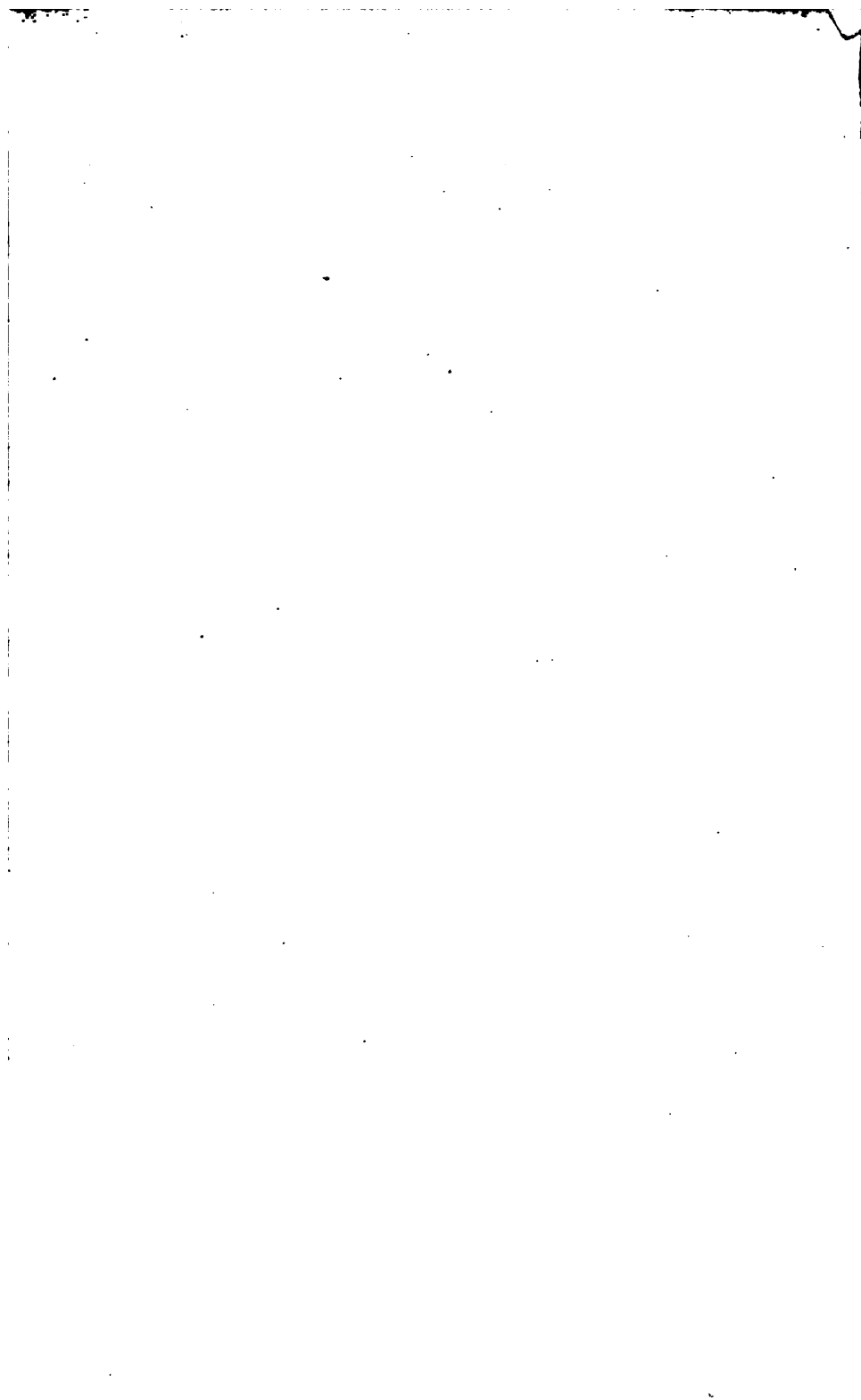
THE GIFT OF
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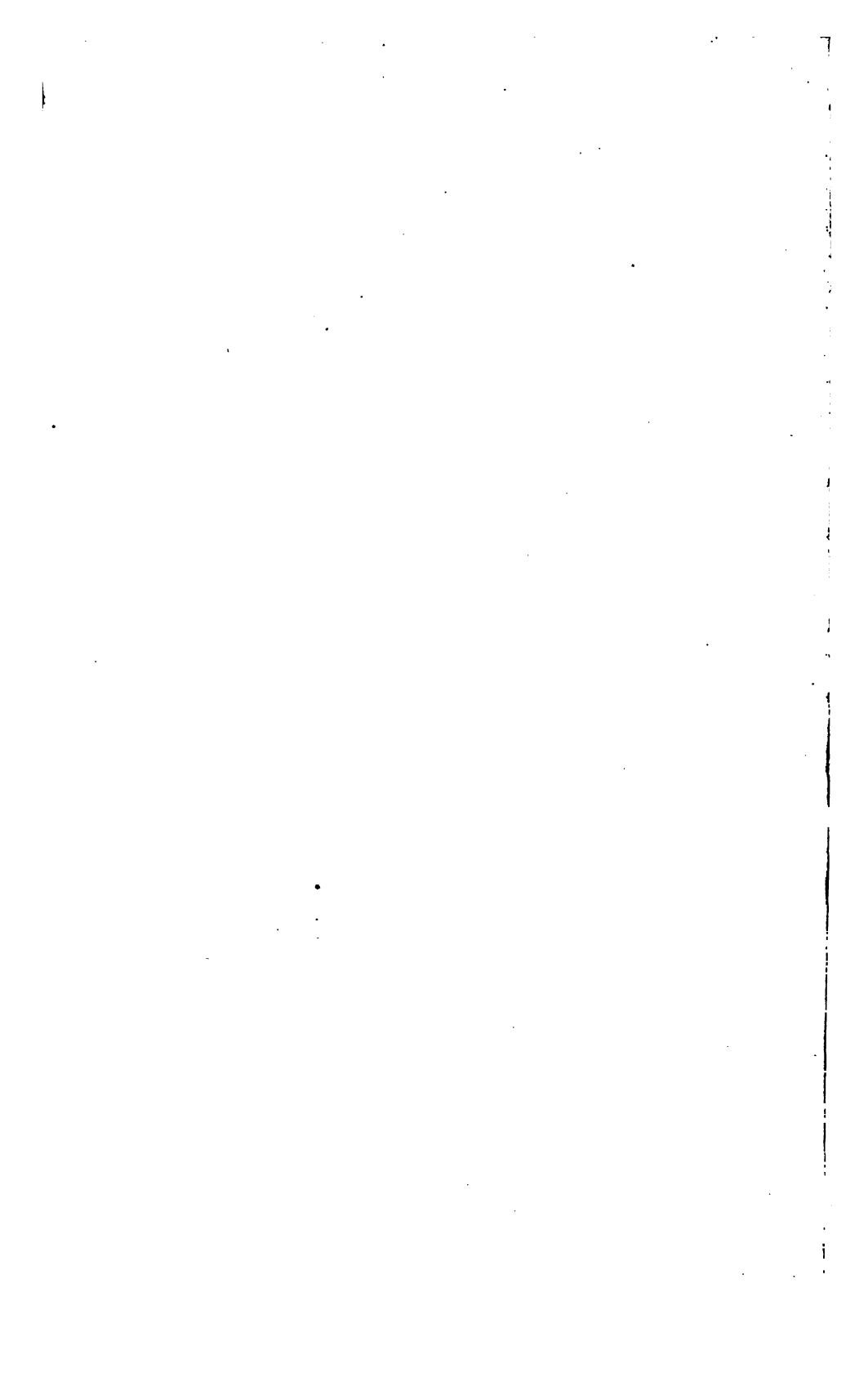
IN MEMORY OF
FRANCIS SKINNER
(H. C. 1862)

Received Dec. 1910.









THE
HORTICULTURAL REGISTER.

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THE

HORTICULTURAL REGISTER.

EDITED BY

JAMES MAIN, A.L.S.

VOL. V.

LONDON:

PUBLISHED BY W. S. ORR & CO., PATERNOSTER ROW.

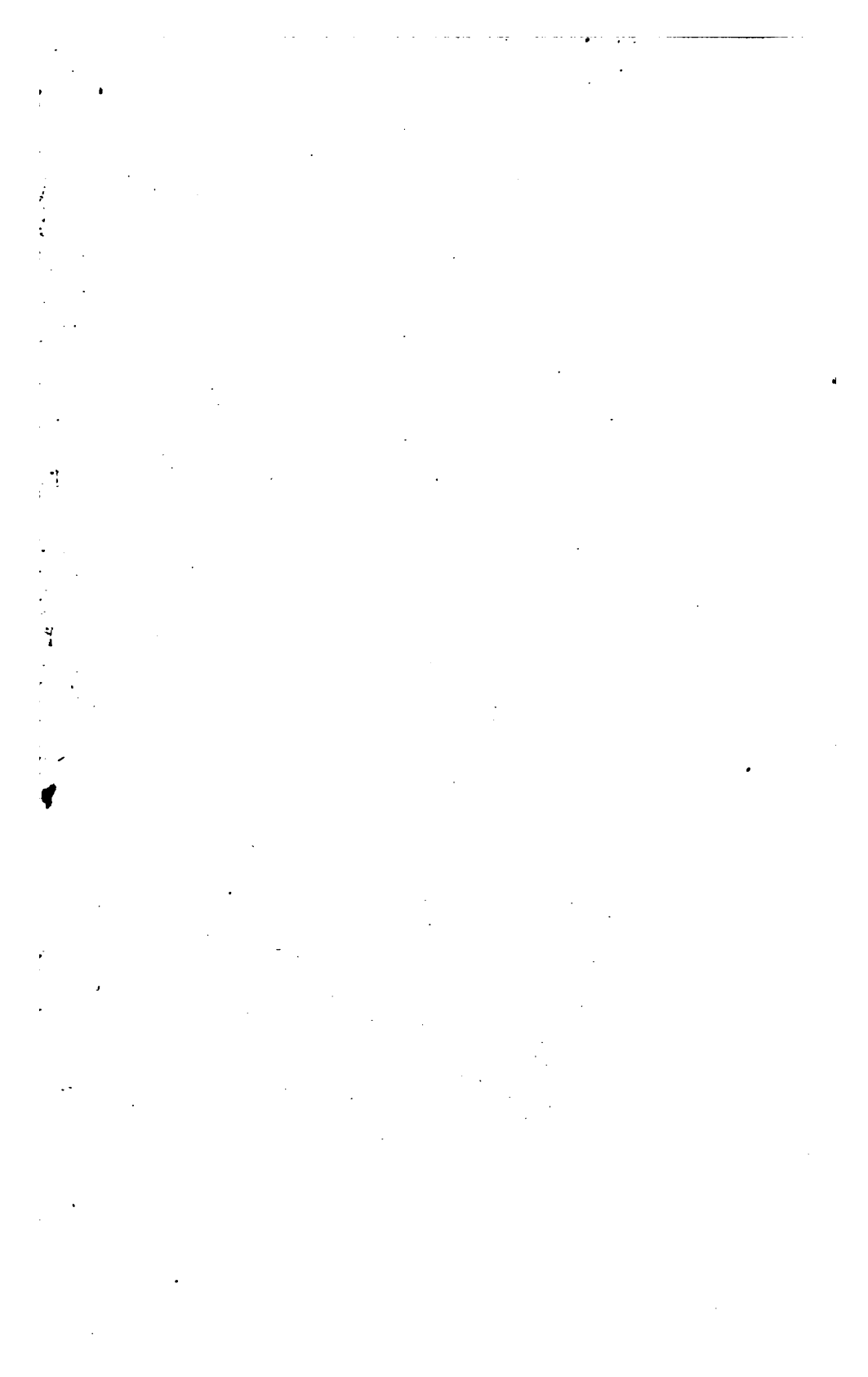
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Dec. 1910

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LONDON :

BRADBURY AND EVANS, PRINTERS, WHITEFRIARS.





Rodgers' Unique Golden Crimson Bizarre Carnation.

PAXTON'S
HORTICULTURAL REGISTER,
JANUARY, 1836.

HORTICULTURE.

ON THE SHRIVELLING OF GRAPES.

Battle Abbey, Nov. 20, 1835.

SIR,—Various are the opinions as to the cause of the disease often seen in grapes, called shrivelling or shanking: different writers on this important subject attribute it to different causes. As information is called for, I will endeavour to pen down my views on the subject.

The vine, like all other things belonging to the vegetable creation, requires time before it can be possessed of a maturing principle, or at least time for that principle to be well organised, so as for the whole vine to be brought into a regular course, that every part may act in strict conformity with each other. Now with regard to young vines, or vines that have been recently planted, if they are called upon to bear a crop of grapes before their roots are established, the disease of shrivelling is sure to follow, for it is impossible for grapes to be brought to maturity while the roots of the vine are out of order; for on the well-establishment of these (the roots) the whole strength of the vine must depend. It is worthy of remark that the disease first shows itself at the points of the bunches, and the extremities of the shoulders. Now, allow me to ask why it commences at these parts of the bunches first? It appears to me that it is the nature of the vine to put forth all the powers of which it is possessed to bring its crop to maturity; and in so doing its strength becomes exhausted, and consequently those berries which are furthest from the vine are deprived of nourishment first. As a proof of what I have stated to be the cause of grapes shrivelling on young vines, I shall bring the following circumstance before you and

your readers. Four black Hamburg grape-vines were planted into a new border, and brought into a new house; the first year that these vines were allowed to bear fruit, two of them were permitted to bear nearly double the quantity of the other two, and the result was, that the two vines which bore the least quantity brought their fruit to a high perfection, but the fruit on the other two vines was small, and not of so good flavour or colour,—shrivelling also made its appearance at the extremities of the bunches; and I must here state, that the vines which bore the great crop were not standing together, nor those which bore the small quantity; but there was first a vine with a large crop, then one with a small ditto, the next with a large crop, and the last with a small ditto. Now I will leave the reader to judge for himself what the cause of shrivelling was in this case, and I think that he will say that two of the vines were allowed to bear above their strength. Now this disease is often seen in vines of middle age, and also in old vines, and of course it will be asked what the cause of it is in vines of these ages? To which I answer, there are more causes than one that will bring it on vines of this description. Sometimes it is from starvation, that is, the border in which the vines are growing is either naturally poor, or it has been exhausted by them: now, in a case like this, the roots are deprived of food, and of course cannot supply the crop. A cold saturated border will bring it on, by rotting off the young fibrous roots, which of course must deprive the vine of that portion of nourishment which is absolutely necessary to bring its fruit to maturity. Digging and cropping the border, if great care be not taken, will also contribute to the above disease; but it is brought on oftener by overbearing the vines than it is in any other way; for it is the nature of the vine to aim at bringing its fruit to maturity, and in so doing it labours hard under a load above its strength, which injures its vital powers, and throws it into a state of debility which it sometimes takes years to recover from. No person can do justice to a vine, unless he knows something of its fruit-bearing powers. I must here state another circumstance, which I was an eye-witness to a few years ago. Two white Syrian grape-vines were growing in one house at the side of each other, and on these vines the disease of shrivelling had made considerable havoc: the gardener of course was anxious to find out the cause, and prevent it, if possible; and after his opinions had been given, the next year he tried the following experiment, which proved quite effectual. When the bunches were formed so as to see which were the best to leave, they were reduced from one vine, so as to leave only a moderate crop on it, and the other vine was allowed to bear a large crop as usual. Now the grapes on the first vine were brought to maturity, but those

on the latter were very much attacked with the disease. I could bring other cases of a similar kind, but I fear that I shall intrude too far on your pages. When I commenced this paper, it was my intention to have entered a little into what I consider to be second causes, and to have shown in what way they often help the disease forward; but time forbids at present. Should the above remarks meet with your approbation, and if any more will be of use, I will forward them at a future time. Yours, truly,

WM. DENYER.

OBSERVATIONS ON THE LATERAL ACCRETION OF THE STEMS OF SHRUBS AND TREES.

HAVING lately had an opportunity of reading and making some observations on Mr. Hoare's excellent treatise on the culture of the grape-vine on open walls, we were particularly struck with that gentleman's ideas concerning the origin and subsequent accretion of the alburnum of the vine deposited during the summer growth. And although we are well aware that Mr. Hoare's ideas on this point of vegetable phenomena are in accordance with a very great majority of vegetable physiologists, we cannot help thinking that there is some misconception on this point of vegetative development, which it is necessary should not remain under any kind of doubt.

It is true that we have heretofore alluded to the same subject repeatedly, and in several different publications. In these publications our own ideas have for the most part been stated hypothetically, and probably so obscurely that they have not attracted much notice, except by those who only gave their opinion by a civil, but at the same time an ominous negativing shake of the head. At the risk, however, of being tedious by "thrumming on the same string," we venture to return to the subject, in the hope that some one of those who only shake the head may be induced or provoked to set the matter at rest for ever.

The passage to which we have alluded stands in Mr. Hoare's treatise and runs thus:—"The leaves attract the sap as soon as it reaches their vicinity, and by one of the most *wonderful processes that can be conceived*, the result of exquisite organisation, elaborate and prepare it, and render it fit for the nourishment of all the parts of the plant. The sap, after being thus prepared, is called the proper juice of the plant. It then returns downwards betwixt the bark and the alburnum, and in its descent is distributed laterally to every part of the plant, until it finally reaches the extremities of the roots. During its descent, a con-

siderable portion of it is expended in the formation of a concentric layer of woody substance betwixt the bark and the wood on every branch, and also on the stem, which layer becomes the new alburnum," pp. 86, 87.

The gravamen of this passage is neither more or less than that wood, with all its complicated structure of fibres, cells, and vessels, is formed by, or generated from, the "proper juice" of the plant. On this statement a very natural question arises, viz. How can this be?

Before attempting to answer the question, or to examine the statement to which it refers, it may be as well first of all to describe the phenomena of the growth of the new alburnum, as it appears to the eye during the summer months.

In early spring the new alburnum is scarcely discernible, having neither appreciable consistence nor apparent organisation; but as the season and growth advance, it becomes conspicuously visible, and perfectly distinct as well from the liber on its exterior, as from the last year's alburnum on its interior side. It separates these two members, the former being raised off from the latter by the incipient alburnum, which is of a viscous consistence, and is then called cambium by botanists.

Soon after midsummer the new membrane begins to show, when examined by a magnifying glass, faint signs of organisation. The longitudinal fibrous tissue, and sap or air vessels which lie in the same direction, together with the horizontal lying cells among which the fibrous and vascular apparatus are embedded, begin to be visible; and in a month or six weeks following, the new alburnum is complete as to the formation of its parts, and continues hardening into timber in the course of the autumn. Before the new layer of alburnum ceases to grow, its exterior surface is sloughed off, to form the new liber or inner bark, which ever after remains distinct.

In order to observe this process, a smooth-barked, free-growing tree must be chosen. Into and through the bark of this, weekly or monthly incisions must be made, to expose the growing alburnum, and to watch its changes from a state of colourless lymph up to perfect wood; or, by observing how a wound made in pruning is gradually covered by this same membrane, a goodidea may be formed of its progressive increase and change from its first to its last condition.

This description of the summer growth of the alburnum has been verified by so many eminent naturalists, and, moreover, is so obviously evident to every one who attends to the accretion of a living tree, or looks at a transverse section of a branch or stem after it is felled, must

be convinced of the truth of the above description of the manner of its annual growth.

There is, in fact, no difference of opinion respecting the manner of the growth; but there are many conflicting opinions as to the origin of the new alburnum. While one insists that it is dilatation of the former year's alburnum, another as confidently asserts that it springs from the liber. A few declare that it is formed by a tissue of fibres which descend from every bud on the branched head; while all these notions are considered untenable by another and very influential class of physiologists, who maintain that the new concentric layer of alburnum, as well as all the other parts of the tree, are formed of the elaborated or *proper juice*. To this class the ingenious as well as the ingenuous Mr. Hoare seems to belong; and however perfectly natural it was for that gentleman to apply to one of the very first authorities for the tenets of his physiological creed, we are far better pleased with the relation of what he himself has observed as the immediate cause of well-ripened wood being covered with plump and fruitful buds, viz. solar light and heat, and full air, than attributing the same effects to inspissated sap absorbed in its passage down to the roots.

But another difficulty occurs: if we can believe and declare that the elaborated sap is "organisable," and that timber, flowers, and fruit can be formed of it, we are in the same breath affirming that an *organised body* can be formed out of a pure *homogeneous fluid*—a phenomenon which we verily believe has never yet been manifested among the most wonderful mutations of nature.

We see the sap of plants in all the forms of pure water, mucus, gum, and resin; the latter so concreted and hard as to resist the action of edge-tools: but never in any state, whether within or out of the tree, is ever any sign of organisation apparent; nor are there any of what may be called the materials of organisation present, namely, detached fibres, cells, or vesicles floating or otherwise contained in the mass, which, by the general law of attraction, might by possibility be brought into orderly contact, and compose a living being.

No; to have a rational idea of the origin of either wood, or flowers, or of fruit, we humbly conceive that we must descend to the common origin or rudiment of all vegetation, and all its parts. And what do we learn by such investigation? We see a pre-existing embryo, whence arises all subsequent expansion and development. From a seed a perfect plant springs up, which, when it has acquired a certain bulk, exhibits successively all the parts of which it is composed. These parts are at first so minute, that they are invisible to the naked eye,

being colourless ; but by careful dissection and optical assistance, they may be detected ; and their identity only disappears when the strongest magnifying microscopes fail. We can detect the plumula and radicle in the smallest seed ; we can observe the incipient shoot, with its leaves and flowers, depressed into the small compass of a bud, whence they are developed in time ; but their identity is as certain and appreciable while in the seed or bud, as they are after they are elongated to three or four feet in length.

If, then, every exterior part of the plant has rudimental existence before expansion, why should we not conclude that the internal annual accretion of the alburnum has a similar origin ?

The only argument which can be brought against this hypothesis is, the inconspicuousness of the incipient alburnum during winter. Then, indeed, its identity is rather to be conceived than perceived, being only a thin coating of glairy matter, covering the outer side of the former summer's alburnum, and within the liber. But as there are many other vegetable productions which are equally inconspicuous in winter, and yet arrive at considerable bulk in summer, this argument has no force. That it exists, and is quickly active in early spring, is obvious from the success of grafting at that season. It is this that forms the living cement which unites the graft with the stock, and in summer is that plastic membrane which receives the inserted bud in its embrace.

Taking all these circumstances into consideration, we can come to no other conclusion, than that the alburnum is generated from a pre-existing membrane, and cannot be formed from any accumulation or mutability of the sap. That the sap is compounded of different qualities incident to the plant ; that it is transfusible throughout the system ; that it fills, distends, and, in many cases, consolidates the ligneous frame, are all self-evident facts, which need not be further insisted on.

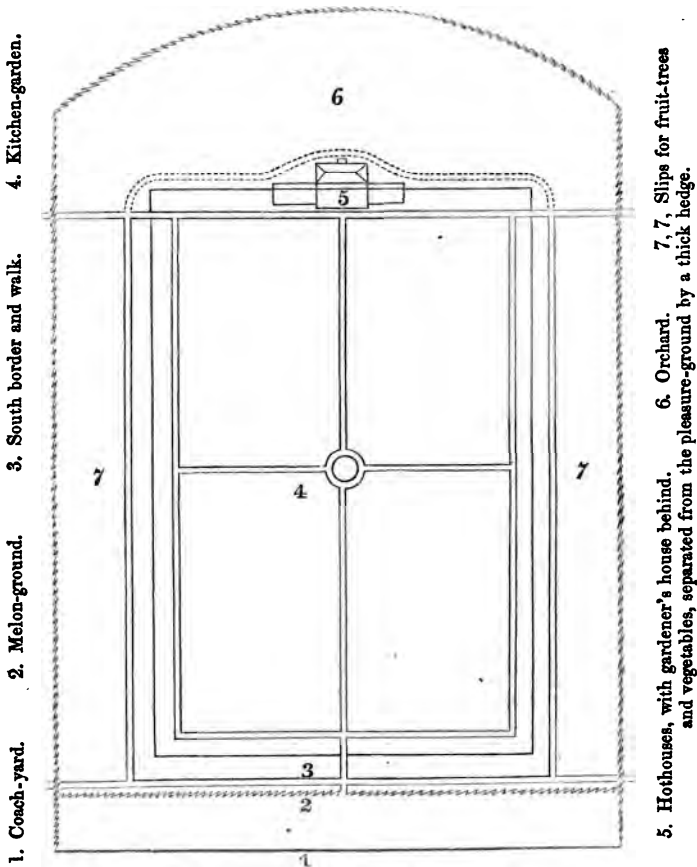
It only remains to add, that we earnestly recommend this subject to the consideration of our readers ; and should any of them see cause for objection to any part of the above statement, we shall feel obliged by any remarks they may be pleased to hand to us. And should our observations meet the eye of Mr. Hoare, whose name we have made free with, and he have any corrections to present, we should feel extremely happy to attend to anything falling from that gentleman's pen.—ED.

LANDSCAPE GARDENING.

LETTER VII.

THE walk which runs parallel to the bottom wall of the kitchen-garden, cutting off the melon-ground therefrom, is continued through to the pleasure-ground on each side. The garden may thus be entered by company without passing through the courts of offices, which are always to be avoided if possible. The stables may be visited by the same route, if desirable.

That you may have a clearer idea of the disposition of the kitchen-garden, &c., I have sketched an outline of the boundaries, walls, and walks, which will render my descriptions at once more brief and explicit.



The melon-ground, you see, is separated from the kitchen-garden by what is called the south border walk, and a narrower border behind a neatly-clipped evergreen privet-hedge, which forms the north or back boundary of the melon-ground. The hedge is about seven feet high, and serves as a sufficient and necessary screen to the dung and litter often necessarily lying about in such a place. The situation of the melon-ground, as has already been alluded to, is particularly convenient, as being near the stables, and also near the cart inlet from the park, by which leaves, mould, tanners' bark, or anything else, may be laid down for the purposes of the gardener. The wall against the stable-yard supports a range of open sheds, in which mushroom-beds are made, or compost or bark is laid to be kept dry. The vacant parts of these sheds are also convenient for holding hotbed lights not in use, flower-pots, mats, and various implements required on the spot.

The pine-pits and cucumber and melon-frames are placed in one, and occasionally in two ranks, parallel with the hedge, and about twelve feet distant therefrom. The frames for forcing culinary vegetables, strawberries, &c., also range with the others, so that the whole has a neat and orderly appearance. Wide-paved trenches are made in the ground for the reception of the earliest crops of cucumbers and melons, the beds being made within pigeon-holed walls, with two-feet spaces all round for the reception of linings when necessary.

Cucumbers are never forced early, because there is generally a winter supply for the table obtained from plants grown in boxes against the back wall of the pinery. The gardener makes what he calls "a seed-bed" about Christmas, to raise plants to be put out at two or three different times in the course of the spring. His earliest frame is one foot narrower than the common size, and the lights for this are glazed in lead. The compost he uses is one-third fresh light loam, one-third leaf-mould, and the other third of dry well-decomposed dung. He forces chiefly by linings, and is particularly careful to keep up a brisk moist heat, always allowing as much fresh air as possible. His supply of fruit begins about the end of March, and continues till after midsummer.

From nine to twelve lights of melons is the usual quota cultivated. For these the beds are very substantial, the frames large, and the compost strong loam, highly enriched with dung. These beds begin to yield about the first of June. Besides these common hotbed productions, many articles are raised on dung-heat; as asparagus, potatoes, carrots, cabbage-lettuce for stewing, radishes, and all other salad plants.

Strawberries are also extensively raised in hotbeds, and in great perfection. The gardener bestows much attention on the preparation of the dung intended for hotbeds; it is repeatedly turned, mixed, and moistened, if necessary, until the whole mass is of one uniform state, and free from all rankness of scent, and chance of violent heat, which it might evolve after being put together in a bed. This preparation is either made in the dung-hole of the stable-yard, or brought within the melon-ground by the gate which forms the communication between.

The melon-ground is well sheltered, which is a great advantage; and though it has not the earliest sunshine, in consequence of the trees to the eastward of it, still the beds receive the sun's rays as early in the morning as they may be safely uncovered.

I asked the gardener whether he did not think the whole range of framing could be heated by hot water? He answered that, though he had had no experience of the hot-water system, yet, from what he had seen and heard of it in the neighbourhood, he was convinced that a range of hotbeds could be worked by a properly-constructed hotbed apparatus, as well as any other forcing-house. A central boiler of sufficient capacity, with mains leading right and left, with branches furnished with stopcocks, and laid to traverse under and round each division of the range, is quite practicable, and, no doubt, would answer well. The most difficult part of the plan would be in forming a suitable table or platform to contain the bed of soil in which the plants are intended to grow, and which would be sufficiently permeable to heat and vapour, so necessary to the healthy and quick growth of the plants. But this difficulty, he thought, might be easily overcome by stout bearers, iron-grating, and long littery dung, to support the bed of earth. Beneath this there would be a vacant space, in which the branch-pipe should traverse to and fro, before being led into the returning main.

Such a scheme as this would be particularly suitable where stable-dung or other fermenting material was scarce, and fuel plentiful; and it would certainly save much labour in the ordinary processes of hot-bed management, besides being less liable to those accidents which often, under the greatest care, assail the sensitive inmates of a dung hotbed.

Mushrooms are raised upon beds made under the shed against the wall of the stable-yard, and in the usual manner. A first bed is made in September, and a second in about three months afterward. The dung of which these beds are made is particularly well prepared previous to its being put into form; it is rather dry than otherwise when

used, as a moderate steady temperature is requisite. The bed is very firmly beaten together when made ; and when the lower part is about milk-warm, nodules of spawn are inserted just within the surface of the bed, pressing the dung closely over them. In a week afterwards the lower part may be earthed ; and when the heat of the top is sufficiently abated, that also is spawned ; and soon after the whole is covered with about an inch and a half of good fresh loam from a pasture, and of such a temperament as to moisture, that it may be patted compactly together without kneading. A mushroom-bed so made requires attention to maintain a regular heat, which is done by the quantity of covering employed. If rather above new-milk heat, a very thin covering will suffice ; but if lower, a thicker coat of both dry straw and mats may be required. Success depends entirely on the right state of the dung, the critical moment of putting in the spawn, and the subsequent equable degree of warmth kept up by means of thick or thin coverings.

I am afraid I have detained you too long in the melon-ground with dry practical matters : but let us proceed into the garden. Before entering it, allow me to say something of the south wall and border. The wall is about eleven feet high, which is quite high enough for properly-trained trees, and for the size of the garden. Trees of a dwarfish, or rather of a dwarfed habit, are invariably more fruitful on walls than very vigorous growers ; and if the whole height be not covered, it is only so much good costly brick-work thrown away. Some sorts of fruit-trees, indeed, such as pears, vines, or cherries, will in time clothe a much higher wall ; but the extra quantity of fruit gained from large trees never makes up for the trouble of training, and pruning, and gathering the crop. High walls are considered serviceable as yielding shelter and warmth to the interior of a garden. This is partly true, but only to trees on the leeward side ; and for culinary vegetables highly walled-in, they actually suffer for want of ventilation.

The south wall just mentioned is covered with the different varieties of the apricot from end to end, great quantities of this fruit, in one shape or other, being required for the use of the family. The trees are chiefly what are called *half-standards* : that is, the proper stocks are budded at the height of five feet from the ground, and the trees for ever after present a clear stem of that height before branches diverge. The latter are trained in all directions from the point of divergence—downwards, horizontally, obliquely, and erect. The first and second positions, I am told, are the most fruitful, and the last the least. This difference is easily accounted for ;—the current of the sap is most

impetuous vertically, and hence the centre of the tree is filled with strong barren shoots; whereas those branches which are led away from the perpendicular, having a more moderate growth, are consequently more fruitful. The length of clear stem up which the rising sap must flow, is also considered inductive of a slower motion of the current; and hence a diminished quantity is received into the branches, causing also additional fertility.

The wall is pretty well covered with these trees; and when the flowers are defended from frost by small twigs of yew or silver fir, generally yield great crops of green thinnings for baking, and ripe for the table, jam, and preserves.

The border is but lightly cropped. The earliest transplanted peas are always raised close under the wall, and the open part of the border is cropped first with radish, lettuce, and other salad plants, and afterward with dwarf kidney-beans.

The principal entrance into the garden is by an old-fashioned iron gate at the bottom, from whence the first view of the whole is very imposing. The middle walk, as well as the general surface of the garden, is regularly, though gently, acclivous; and all the longitudinal lines of walls, walks, and espalier rails, being perspectively converging to the centre of the vinery, presents such an orderly display of regularity as cannot fail to gratify the eye, while it exhibits the beauty of order. In this picture the hot-houses are the principal object, and are seen to great advantage from the iron gate. The upper windows of the gardener's house are just seen over the vinery, and its hipped roof forms a fine apex to the whole range of glass. Add to this the fine background of lofty trees, which on all sides appear to embrace, without shading, and shelter, without suppressing, the garden from every wind that blows.

As the garden is neither on the highest nor on the lowest part of the sloping ridge on which the house and all its accompaniments are placed, the situation is well chosen. Had it been on the summit, it would have been too much exposed to the fury of winds from all quarters; and had it been placed in a low and dank valley, colder air and sharper frost would have often cut off or retarded the tender firstlings of the year. As the coldest air always slides down a declivous surface, the lowest situations are consequently constantly the coldest; even the lower end of the garden I am describing is always more chilly than the upper end; and were it not that the palisade gate at the bottom allows the fleece of cold air to escape out, it would be much more and injuriously so. Whether an open-work gate was preferred for this station, as an outlet for frosty air, is uncertain; but it is a lucky inci-

dent, and is well worth imitation in the arrangement of all kitchen-gardens occupying the side of a hill.

The borders, both within and on the outside of the wall, are eleven feet wide, to correspond with the height of the wall, which is a kind of general rule in laying out gardens. The walks are all five feet wide, except the middle and the upper cross ones, which are six. On the interior sides of the side and end walks, and on each side of the middle and cross walks, there are borders four feet wide, edged with box next the gravel, and with espalier rails within.

The espalier rails, as they are called, are of the simplest construction, being nothing else than a rank of six-feet stakes, selected for the purpose by the woodman when felling underwood. These, after being trimmed, pointed, and charred at bottom, are driven, by line, one foot two inches into the ground, and connected at top by a narrow ledge, or fillet of soft tough wood, by nails driven into each stake. Only perfectly straight and smooth stakes are used; they are rather more than an inch in diameter, and when correctly driven and headed by the fillet, really look very light and neat. The fruit-trees, consisting of pear, apple, plum, and cherry, are planted on the side next the walk, and are mostly trained with one or two upright stems, with horizontal branches fastened to the stakes by willow twigs, or any kind of durable string.

Paths surround the quarters within the espaliers, and are separated from the ground appropriated to common vegetables by edgings of parsley, strawberries, or some other low-growing plant.

In the centre of the garden there is a basin of water, supplied from the general pipe which conveys the same from a spring on the hill above, serving in its course the little lake in the pleasure-ground, the gardener's house and hot-houses, the basin just mentioned, a trough in the melon-ground, all the offices, and the mansion-house itself.

The walls of the garden are planted on both sides with fruit-trees of all the common sorts for which wall treatment is necessary. The south aspect, at the ends of the hot-houses, is covered with six of the best sorts of peaches and nectarines: of the former, four dwarfs, and of the latter, two riders between the dwarfs, to cover the upper part of the wall. On the borders in front, and about six feet from the wall, are planted a rank of fig-trees, six on each side, pruned in the bush form, and kept pretty low. The roots of these trees are well mulched in summer, and covered in winter, and their branches have a temporary covering of mats in severe frost. With such care bestowed, they generally bear plentifully.

The west aspects are appropriated to peach, nectarine, fig, and a few

apricot trees ; the east aspects bear plums, cherries, and French pears ; and the north exposures are chiefly covered with morello cherry-trees, with currants in the intervals.

There are many different styles of training practised in this garden ; most of the trees on the walls are trained in the fan manner, the principal leaders being at good distances apart, and the intervals kept moderately filled with young wood. Such as bear their fruit on the last year's shoots, as the peach and morello cherry, are trained in right lines, in all directions from the top of the stem, whether they be dwarfs, half-standards, or riders. Pears, plums, and several sorts of cherries, bear their fruit on what are called spurs, as well as on young shoots of one or two years' growth ; and therefore the trees are allowed to divide themselves into a certain number of principal branches, trained first obliquely, and afterwards horizontally along the wall, in order that they may not too soon surmount it, and so require to be cut back. When a tree has acquired a good size, or has covered the space allotted to it, much skill is required to keep it stationary, and at the same time fruitful. This can only be done by *preventing* a summer growth of useless breast-wood, rubbing off every misplaced, redundant, or useless *bud* in the months of May and June, which threatens to come forth only to induce an unnecessary energy in the roots, and divert the sap from the fruitful parts of the tree. A few only of those summer-shoots are preserved, and laid in close to the wall, but stopped about midsummer. By these manipulations the trees are kept in a moderate state of healthy growth and consequent fruitfulness. This rule of fruit-tree culture is always everywhere bestowed on peach and nectarine trees, but seldom on inferior fruits, though equally applicable to, and as necessary for them : indeed all trained trees require this attention, because they are ever endeavouring to regain their natural forms by the production of strong shoots on and in the near neighbourhood of the stem. To prevent such growth requires constant vigilance, for it serves no good purpose to prune them off after they are produced, as is too frequently the custom.

The espalier trees are almost all trained with one upright stem, with lateral branches about a foot apart, trained horizontally. This form of training is adopted for its neat symmetrical appearance and suitability for espaliers. The trees, however, are very subject to "run riot" in the summer months, and be disfigured by a multiplicity of barren shoots, if they be allowed to come forth. I shall next lead you into the hot-houses, but, for the present, adieu.

A. B.

REVIEW OF BOOKS.

A Practical Treatise on the Cultivation of the Grape Vine on open Walls. By Clement Hoare.

HAVING been particularly called on to give our opinion of this work (page 471, Vol. IV.), we procured a copy, and have perused it with attention. We had conceived a high opinion of the work from the commendatory terms in which we had heard it spoken of by competent judges; and we are happy to avow that, on turning it over, we have felt no cause to alter our previously formed opinion.

The book opens with a brief history of the vine, and of its introduction into Britain, and shows how extensively it was cultivated in early times, compared with what it is now. This neglect of the vine the author seems to consider as a national misfortune; but the very circumstance is presumptive proof that, as a national or commercial concern, vine-growing and wine-making never were profitable concerns in this country. Wine was never considered a necessary of life for the labouring classes; they required copious draughts of liquor of a more invigorating and substantial character than even the best wine, doled out in tiny modicums by the hand of prudence, or that a regard for sobriety could allow to be partaken of by the thirsty and fatigued labourer; besides, a few fleeces of British wool would command as much of the richest continental wine as ever was required for medicinal or festive purposes, without either the labour of growing the fruit, or the expense of manufacturing the wine at home. Add to this the fact that the finest fruit is never used as an article of diet in this country, as it is in warmer latitudes; and therefore grapes were never valued but as a luxury in England: and hence the neglect of the vine as a profitable plant. There is yet another circumstance which may have operated to discourage the cultivation of the tree, namely, the rule of political economy which enjoins to "*grow necessities and import luxuries*;" a rule which has been observed by our legislative government respecting several other articles besides that of wine—tobacco, for instance.

Mr. Hoare, it seems, is not a professional gardener; but, nevertheless, he has, by much well-directed observation, acquired a most respectable stock of the best ideas of practical gardening respecting the culture of the vine. He appears to have read much, though not everything, that has been written on the subject, otherwise he would have known that his principles have been long and steadily acted on by all the first-rate professors of the art. Notwithstanding this, in strict

justice we willingly confess that we have never met with a treatise in which the open-wall culture of the grape vine has been described with more accuracy, or which contains more sound practical knowledge. Indeed the book is written with much more didactic precision than those written by professional gardeners; because, perhaps, the latter write for those who are supposed to know somewhat of the matter, whereas the former addresses himself to those whom he considers entirely ignorant of the subject.

Like every gardener who knows his business, Mr. H. propagates his trees by layers in pots or cuttings; he transplants at the proper season, and in the most proper manner; he forms his vine-borders according to the best and oldest established rules, compounding the most suitable materials, affording enriching substances which yield a steady and permanent supply, allowing only a moderately deep but extensive horizontal range for the roots, and applies dry or liquid top-dressings in the most judicious manner. He moreover pays particular attention to gain a large volume of effective roots, before allowing his young trees to exhaust themselves by premature fruitfulness; and this attention is constantly bestowed in every stage of the life of the tree. That which an experienced pruner judges of by a previous knowledge of the state of a vine, and by ocular demonstration of its capability to bear fruit, our author has, by dint of persevering attention, ingeniously taught himself to determine with precision—the capability to bear of every individual tree under his care; and this is by a very simple test, namely, taking the girth of the stem close to the ground. For his manner of ascertaining this, we must refer our readers to the book itself, as we think it hardly fair to transcribe what we consider a very valuable feature of the little volume. Fixing on the diametric bulk of the main stem as a mark of the extent and powers of the root to nourish prolific shoots, and mature a proportionate quantity of fruit, we consider the very best criterion which could be selected, to enable the pruner to judge of the number and lengths of the shoots whence the next summer's crop is expected.

But what we consider by far the most valuable part of the book, and for which its author deserves the thanks of the public, is his adoption of the *alternate long-shoot* mode of training, so long and so successfully practised in hot-houses, for vines on walls in the open air. It teaches every labourer to prune his vine as he prunes his raspberry plants. The established root of the latter annually throws up a birth of young shoots, while those of the preceding year are yielding fruit. When this is gathered, the shoots which bore it are all cut away, and at the same time as many of the new shoots are selected and preserved

as the pruner thinks the roots and the healthy amplitude of the shoots promise to yield a fair crop. The only difference in the procedure is, that, while the raspberry produces its new shoots directly from the crown of the roots, the vine must be trained at first with arms turned right and left close to the ground, to form a base whence all the future shoots arise, replacing each other in alternate succession. The numbers of the bearing-shoots are two, four, or six, according to the known power of the root, or the thickness of the main stem, which always guide the manager both as to the number of the shoots, and also of the number of the promising buds on each; for, respecting the latter, Mr. H. is quite cognisant of the old custom of thinning out redundant buds, as well as unnecessary shoots.

Mr. H. expresses surprise that this simple method of treating the vine, which he admits is commonly practised in hot-houses, has not been adopted for those on open walls. We will not be certain, (not having the books at hand to refer to,) but we think both Forsyth and Abercrombie advised this mode of training the vine in the open air, or at least a very similar modification of it. But the fact is, grapes produced in the open air of this climate were never held in much estimation at the tables of the opulent, and therefore were never an object of special regard in superior gardening. Continental travellers assert that they never meet with a thoroughly ripened grape from off the open walls in English gardens; but, under the management of Mr. H., his grapes are not only perfectly ripened, but highly flavoured, and, moreover, arrive at such a size as is but seldom seen in our best-constructed vineries. This is an advance indeed, and one of the most valuable discoveries of the present time.

We are quite aware that by the concentration of the vegetative powers of a healthy plant, any limited number of its parts will be greatly, if not monstrously enlarged; and that if a large system of roots be permitted to produce only a few shoots, instead of a great number, the few will be correspondingly amplified in circumferential bulk, in size of foliage, as well as in size of fruit. By these means it is quite probable that, in connection with Mr. Hoare's incessant and superior manner of summer manipulations, his fruit may arrive at the extraordinary size and perfection which he states them to do under the care he bestows.

While we highly approve of the principles on which our author has founded his practice as a vine-dresser, we deem it only applicable, in a limited degree, for a private family. Eight or ten trees managed as Mr. H. directs, would be as many as could be conveniently attended to, and would yield as much fruit as could be used while in season.

For wine-making, or on the premises of a market-gardener, trees may be put in in any number, and walls covered to any extent; and for either the purpose or the profit, no better practice could be adopted. But the weekly, we may say the daily attendance and labour required by a long vine-wall, with the shoots trained either upright, horizontally, or serpentine, would be a serious drawback on the value of the crop. Training the leaders, stopping the laterals, pinching off tendrils, thinning the bunches, and regulating the foliage so as to obtain the requisite degree of shade as well as solar influence, would be an Herculean task, to be performed by the enthusiasm of an amateur, perhaps, but could hardly be imposed as part of the daily duty of a private gardener, without extraordinary assistance.

We can hardly find words to express how highly we approve of every practical rule laid down by Mr. H. relative to the wall-culture of the vine; they are all excellent, and conformable with the best practice of experienced men. What he has advanced concerning the formation of alburnum, the generation of fruit-beds, and the elaboration of the sap, all being invisible processes, is not, perhaps, so convincing. But as these are, we venture to say, borrowed ideas, (and from the highest authorities too,) they do not, nor should not lie at the author's door; and moreover, right or wrong, as they do not affect in any way his practical directions, they cannot be considered as any blemish on the face of his very excellent treatise.

We may add in conclusion, that though the book be professedly written for the open air vine-grower, cottagers, and suburban householders, we are most certain that it will be a welcome treat even to every first-rate horticulturalist; for unless a practical man be thoroughly acquainted with the principles of vine-culture, as set forth in the volume, he cannot by possibility be competent to cultivate vines under glass.

The book contains only 164 pages, and is divided into fifteen sections or chapters, viz. Introduction—Observations on the present method of cultivating Grape-Vines on open walls—On the Capability and Extent of the Fruit-bearing Powers of the Vine—On Aspect—On Soil—On Manure—On the Construction of Walls—On the Propagation of Vines—On the pruning of Vines—On the training of Vines—On the Management of a Vine during the first five Years of its growth—Weekly calendrical Register—General autumnal Pruning—On the Winter Management of the Vine—A descriptive Catalogue of twelve sorts of Grapes most suitably adapted for Culture on the open wall.

In this list Mr. Hoare includes the Frontignas, the Black Prince,

and Black Muscadine; sorts which are often imperfectly ripened even under glass.

INTRODUCTION TO THE SCIENCE OF BOTANY, *illustrated on an entirely new Principle, by a Series of highly-finished Delineations of Plants coloured to represent Nature; including characteristic Details of the Physiology, Uses, and Classification of the Vegetable Kingdom.* By Chas. F. Partington, author of various Scientific Works, and editor of the "BRITISH CYCLOPÆDIA," &c.

The book and its accompanying illustrations are tastefully got up, and intended for the lecture-room. The figures are on strong paste-board, each provided with a stand for placing on a table, and intended to be seen from a distance. Linnæan botany is the theme, and the dryness of its systematic details is relieved by pleasing narration and interesting observations. For private reference in the family drawing-room, the elegant book, ornamental case, and fourteen coloured delineations, will be a most suitable *appliqué*; and for provincial lecture, or reading-rooms, the whole will be found eminently useful.

We append a few sentences from the beginning of the first lecture, as a specimen of the style in which the book is written.

"A scientific acquaintance with the vegetable kingdom now forms an essential portion of human knowledge; and systematic botany, which, even in the last century, was little more than a dry detail of abstruse terms, without either instruction for the student, or interest to the general admirer of this beautiful portion of natural history, has now become a most delightful subject of scientific research. In the present day we do not, as in the olden time, merely catalogue the names of plants that surround us, but the botanist becomes acquainted with their attributes and properties; neither is the study of the vegetable kingdom an isolated science, as it forms a part of the philosophy of the universe; and we see the hand of creative goodness as clearly in the wonderful organisation of the humblest lichen, as in the towering luxuriance of the cedar which o'ershadoweth the mountain.

"Some writers have affirmed that botany is valuable only to the naturalist; but a very brief examination of the science will serve to show that the data on which it is founded should be taught among the first principles of utilitarian knowledge, as there is scarcely a plant on the face of the earth that may not, in some measure, be made available in supplying the wants of man."

THE AGRICULTURAL AND HORTICULTURAL ANNUAL FOR 1836; *or Annual Register of the most important Discoveries and Improvements in Farming, Gardening, and Floriculture, with practical*

Details, &c. By Baxter and Son, Lewes, Sussex, authors of the "Library of Agricultural and Horticultural Knowledge," &c.

While so many new books, under the name of *ANNUALS*, are every year brought forth at this season, it is not at all to be wondered at that the Messrs. Baxter should conceive that a volume of a more useful character would be acceptable to the public. While the others are chiefly devoted to mental amusement and refined sentimentality, the book before us aims at something more valuable, namely, the practical knowledge of the kindred arts of farming and gardening. It has no pretensions to originality; the essays which it contains are selected from the best modern publications, and with very good discrimination. The idea of making the book a register of the discoveries and improvements of the past year, is also good, and particularly to those who are not general readers.

The embellishments to the volume are two specimens of Mr. G. Baxter's new-invented branch of art in "printing in oil colours," which are very beautiful, and a good proof that this species of graphic art will be highly useful for publications in which landscapes, animals, or plants require to be represented.

It appears that Messrs. Baxter contemplate continuing this description of annual; and if so, we would wish to see it less bulky, and with as many illustrations of the best breeds of cattle as can be afforded at the price; and, we presume, if got up for the farmer's parlour, rather than for the landlord's drawing-room, it would have a more extensive sale.

BRITISH FLOWERING PLANTS, with the scientific and English Names, Linnæan Class and Order, natural Order, generic and specific Characters, References to the most popular Botanical Works, Localities, Time of Flowering, Descriptions of the Plants, and Dissections showing the essential Characters. By W. Baxter, A.L.S., F.H.S., &c., curator of the Oxford Botanic Garden, and author of "*Stirpes Cryptogamæ Oxoniensis*."

This is an excellent little work for any one wishing to become acquainted with English Botany. A coloured figure of every genus, with accurately drawn dissections, magnified, if necessary, are given on each plate. The descriptions are full, as well as clear, and so plain, that he "who runs may read."

Although the work, when complete, will not be "a cumbrous tome," it requires no small labour in compiling and arranging, because the author gives all the best authorities, as well as synonyms and localities, most useful adjuncts to such a work. To young gardeners we can

recommend it as well worthy their attention, as it is a descriptive list which every beginner may peculiarly make his own, by "ticking off" every plant he meets with in his walks.

NOTICES OF PLANTS FIGURED AND DESCRIBED IN THE FOLLOWING
BOTANICAL PERIODICALS, VIZ.

EDWARDS' BOTANICAL REGISTER for December, 1835, continued by Dr. Lindley.

1. *Elichrysum bicolor*. Two-coloured Elichrysum. "A beautiful new hardy annual, introduced by Mr. Low, of the Clapton Nursery." It is a native of Van Diemen's Land, and very much resembles some of the *Gnaphaliums*, with which genus the *Elichrysums* were formerly united.

2. *Macradenia triandra*. Triandrous Long-gland. An orchideous plant, a native of Surinam. The foliage and manner of flowering are much like many others of this curious order of plants, and require similar culture, in a warm moist stove.

3. *Coccoloba virens*. Green sea-side Grape. A hot-house plant, which flowered in the hot-house of Sir Abraham Hume, at Wormleybury, two years ago. The foliage is handsome, and the flowers are borne on racemes, like those of the berberry.

4. *Oxalis Piotta*. Piotta's Oxalis. A beautiful little frame perennial, and very attractive when grown in a pot, the surface of which it covers. It is a native of the Cape of Good Hope, whence it was obtained by Mrs. Marryat, through Italy. It is at present possessed only by that lady and a few of her friends.

5. *Ochranthe arguta*. Five-toothed Pale-bloom. A native of China, which flowered in the Horticultural Garden in March, 1826. The plant died soon afterward, and has not since been re-introduced. Dr. Lindley is uncertain to which order in the natural system it belongs, but for the present has placed it in *Hypericaceæ anomala*.

6. *Rhododendron pulcherrimum*. Lovely Rhododendron. A garden variety, obtained by Mr. Waterer, of Knaphill, between *R. arboreum* and *caucasicum*. There is another variety, called *R. Nobleanum*, very like the above in all respects, except that its flowers are of a brilliant rose-colour. "Both are amongst the handsomest hardy shrubs in cultivation."

7. *Galatella punctata*. Dotted Galatella. A hardy herbaceous plant, belonging to *Compositæ*. It is a native of Europe, and grows well in our shady borders, forming a thick bush about two feet high.

8. *Eulophia lurida*. Lurid Eulophia. Another orchideous curiosity, which Dr. Lindley says is one of the easiest of cultivation of the whole exotic tribe of the genus. It is found growing on trees at Sierra Leone, and grows freely in a moist stove, if placed on a rough stone.

SWEET'S BRITISH FLOWER-GARDEN for December, 1835, continued by D. Don, Esq.

1. *Silene regia*. Scarlet Catchfly. A very showy plant, belonging to the natural order *Caryophyllæ*. This plant was discovered by Mr. Nuttall, who regards it as the most splendid of the genus. It is a hardy perennial, thriving in a moor-earth and loamy soil, but rarely ripens seed in this country.

2. *Lupinus bimaclatus*. Twin-spotted Lupine. A very pretty perennial Lupine, from Texas, in Mexico, where it was discovered and sent to this country by Mr. T. Drummond. This species is well distinguished by its cylindrical woolly pods, and, like its congeners, well deserves a place in every flower-garden.

3. *Calliopsis Drummondii*. Drummond's Calliopsis. A beautiful North American annual, possessing all the striking character of its ally, the *C. bicolor*, (formerly *Coreopsis tinctoria*,) but from which it is specifically very distinct.

The plates of the three preceding plants are from drawings by a Miss Mitchell, who promises to excel as a flower painter.

4. *Phlox Drummondii*. Drummond's Phlox. This very handsome herbaceous plant, Mr. Don says, is remarkable as being the only annual one in the genus, exhibiting by that character, as well as by having the upper leaves frequently alternate, a near approach to *Collomia*, which differs only in its stamens projecting beyond the mouth of the tube. It is a native of Mexico, discovered there, the seeds collected, and sent home last spring by the late Mr. T. Drummond. The plant flowered in Dr. Neill's collection at Edinburgh, and the plate was engraved from a drawing by Mr. James Macnab of the same place.

PAXTON'S MAGAZINE OF BOTANY for December, 1835, contains—

1. *Dendrobium moschatum*. Musky Dendrobium. A very splendid-flowering orchideous plant. The flowers, when fully expanded, measuring nearly three inches across, and finely variegated in colour.

2. *Rondeletia speciosa*. Handsome *Rondeletia*. A very ornamental shrub, native of the West Indies. The flowers grow in showy tufts on the points of the branches, and are high-coloured.

3. *Calliopsis bicolor atrosanguinea*. Deep-coloured *Calliopsis*. This is a variety having larger flowers and deeper colour than its prototype, and therefore is worthy the notice of the flower-gardener.

These figures and descriptions are followed by a valuable paper on the construction and various modes of heating hot-houses.

SMITH'S FLORISTS' MAGAZINE for December, 1835, contains—beautiful figures of the *Verbena Lambertii* and *V. melindres* on the same plate; also *Amaryllis Belladonna*, var. *pallida*; the *Royal Adelaide Dahlia*; and the *Early Blush* and *Tasselled yellow Chrysanthemums*. They are all beautifully and faithfully drawn and coloured, and their history and practical directions for their culture given with each plate, very much enhances the value of the work.

We see by the newspapers that a plant of the *Luculia gratissima* is now in full flower in the conservatory of Messrs. Lucombe, Pince, and Co., at Exeter. This, a genus named and described by the late Mr. Sweet, is a native of Nepal, and one of the most agreeably fragrant of plants.

MISCELLANEOUS INTELLIGENCE.

ON BLIGHTS.—There is nothing so destructive to a fruit garden as blights; nor is there anything in the business of gardening which requires more of our serious attention and endeavours to guard against.

Blight is often caused by a continued dry easterly wind for several days together, without the intervention of showers, or any morning dew, by which the perspiration in the tender blossoms is stopped, that in a short time their colour is changed, and they wither and decay; and if it happens, that there is a long continuance of the same weather, it equally affects the tender leaves, as from the same cause perspiring matter is thickened and rendered glutinous, which closely adhering to the surface of the leaves, becomes a proper nutriment to small insects, which are always found preying upon the tender branches of fruit and other trees, whenever this blight happens. But insects are not the first cause of blights, as has been imagined by some naturalists, though it must be allowed that whenever the insects meet

with such food they multiply exceedingly, and are instrumental in promoting the distemper, so that many times when the season proves favourable to them, and proper care has not been taken to prevent their depredations, it is surprising how soon whole walls of trees have suffered by contagion. The best known remedy for this distemper is, to take in the spring, just before the buds begin to burst, two pounds of soft soap, one pound of black sulphur, eight ounces of tobacco, a tea cup full of urine, three tea spoonsful of oil of turpentine, and one ounce of nux vomica, to which add four gallons of rain water, boil them together till about the consistency of paint, to be put on when about milk warm with a brush, such as is used for painting. If attacked in the spring or summer, take one pound of black sulphur, one pound of soft soap, and four ounces of tobacco, to which add four gallons of rain water, to be put on with a sweeping brush, and used milk warm; the garden engine may be used freely over the trees when the fruit is fairly set, with pure water, as long as is thought necessary, to clear them if possible from this glutinous matter, so that the respiration and perspiration may not be obstructed; but whenever the operation of washing the trees is performed, it should be early in the day, that the moisture may be exhaled before the coldness of night comes on, especially if the air be frosty; nor should it be done when the sun shines very hot upon the walls, which would be likely to scorch the tender blossoms.

Another cause of blights in the spring arises from sharp hoar frosts, which are often succeeded by hot sun-shine in the day time; this is the most sudden and certain destroyer of fruit that is known; as the chilly air at night hurts the tender parts of the blossoms, and the sun shining hot upon the walls before the moisture is dried from them, which being in small globules, collect the rays of the sun, a scalding heat is thereby acquired, which scorches the tender parts of flowers and other parts of plants. The method to prevent this mischief is, to cover the walls with bunting or canvass, fastened so as not to be disturbed by the wind, and suffered to remain on during the night, but taken off every day when the weather permits; although that method is thought by some to be of little service and may be really prejudicial if the trees be too long covered, or incautiously exposed, yet when this covering is used properly, it frequently proves a great protection to fruit-trees; and if the covering be fixed near the upper part of a wall, and be fastened to pullies so as to draw up or let down occasionally, the operation will be easy and the success will sufficiently repay the trouble.

There is another sort of blight that sometimes happens later in the spring, in April or May, which is often very destructive to orchards and plantations, which has hitherto baffled all attempts to prevent it—this is called a fire blast, and in a few hours not only destroys the fruit and leaves, but very often part, and sometimes entire trees; this is supposed to be effected by volumes of transparent vapours which approach so near to a hemisphere in the upper or lower surface, as to concentrate the rays of the sun so as to scorch the plants or trees; against this enemy there is no guard.

Another sort of blight—But that blights are frequently no more than an inward weakness or distemper in trees, will evidently appear, if we consider how often it happens that trees against the same wall, and aspect, and enjoying the advantages of sun and air, with every other circumstance which might render them equally healthy, are very often observed to differ greatly in strength and vigour; indeed, we generally find weak trees to be blighted, when vigorous ones in the same situation escape, which must be in a great measure ascribed to their unhealthy constitution. This weakness in trees, therefore, proceeds either from the want of sufficient supplies of nourishment to maintain them in perfect vigour, or from some ill qualities in the stock, or distemper of the buds or scions, which they had imbibed from the parent trees, or from mismanagement in pruning, &c., all which are productive of distempers in trees, and of which they are with difficulty cured. Now, if that be occasioned by weakness in the trees, we should endeavour to trace out the true cause; first, whether it has been occasioned by bad pruning, which is often the case; for, how frequently do we observe peach trees trained up to the full extent of their branches every year, so as to be carried to the top of the wall in a few years after planting; when, at the same time, the shoots for bearing have been so weak, as scarcely having strength to produce their flowers, this being the utmost of their vigour, the blossoms fall off, and many times the branches decay, either the greater part of their length, or quite down to the place from whence they were produced; whenever this happens to be the case it is ascribed to a blight. Others there are who suffer their trees to grow fast, as they are naturally disposed during the summer season, without stopping the shoots or disburdening the trees of luxuriant branches, by which means two, three, or four shoots will exhaust the greater part of the nourishment of the trees all the summer, which shoots at the winter pruning are entirely cut out, so that the strength of the trees is employed only in nourishing useless branches, and they are thereby rendered so weak as not to be able to

preserve themselves ; but should the weakness of the trees proceed from a fixed distemper it is the better way to remove them at first ; and after renewing the earth, plant new ones in their places ; for if the soil be a hot burning gravel or sand in which your peach trees are planted, you will generally find this to be the case after their roots have got beyond the earth of your border, for which reason it is much more advisable to dig them up and plant fresh ones.

At this time we shall merely add some important directions concerning the proper management of fruit trees. There are many persons who suppose, that if their trees be kept up to the wall or espalier during the summer, so as not to hang in disorder, and in winter have a gardener to prune them, it is sufficient ; but this is a mistake, the greatest care ought to be employed in the spring, when the trees are in vigorous growth, which is the only proper season to procure a quantity of good wood in the different parts of the trees, and to displace all useless branches as soon as they appear, that the vigour of the trees may supply such as are designed to remain, which will render them strong, and more capable of producing good fruit. If all the branches were permitted to remain, the most vigorous would imbibe the greatest share of the sap, whilst the rest would be starved, and only produce blossoms and leaves ; for it is impossible any person (however well skilled in fruit trees) can reduce them into any tolerable order by winter pruning only, if they have been wholly neglected in spring. There are individuals also who do not entirely neglect their trees during summer, as those before mentioned, but resort to what they call summer pruning, neglecting them at the proper season, which is in April or May, when their shoots are produced, and only about midsummer go over them, nailing in all their branches, except such as are produced fore-right from the wall, which they cut out, and at the same time often shorten most of the other branches. This is an entirely wrong practice, for those branches which are intended to bear in the succeeding year should not be shortened during the time of their growth. This stopping will cause them to produce one or two lateral shoots from the eye below the place where they were stopped ; these will draw much of the strength from the buds of the first shoots, whereby they are often flat, and do not produce their blossoms ; but if the two lateral shoots are not entirely cut away at the winter pruning, they will prove injurious to the trees, as the shoots which they produce will be what the French gardeners call water-shoots, and if suffered to remain on the trees till midsummer, will, as already has been observed, rob the other branches of their support ; besides, by shading the fruit all the spring, and when the other branches are fastened to the wall, the fruit, by being

so suddenly exposed, will receive a very great check, which will cause their skins to become tough, and render them pulpless.

These remarks apply principally to stone-fruit and grapes: pears and apples being much harder, do not suffer so much.

Your's very respectfully. WM. MATHERS.

Wanlep, 1835.

[We insert this paper with pleasure, because it contains some very excellent remarks on the summer management of trained trees; and also because it alludes to two or three points about which there are some doubts, we would recommend to the attention of our readers. The first point is, whether the attack of insects be the *effect* or the *cause* of disease? The next point is, how is it that, if the sun's rays fall on a frosted plant, the destruction is more extreme than if the plant were kept shaded by a canvas or bunting covering, or if even thawed off by water before the sun shines on it? Another question may be put concerning the "*fire-blast*," and whether it can possibly be caused by any accidental combination of vapours floating above the earth? That constitutional weakness attracts and favours the depredations of insects, there is no doubt, and we quite agree with Mr. Mathers, that the cause of such weakness should be sought out and remedied as he proposes.—
ED.]

OBSERVATIONS ON THE PROPOSED GARDENERS' SOCIETY.—The formation of a society for the diffusion of scientific knowledge among young gardeners, is a topic which several of the young men in this neighbourhood have for some months past been trying to agitate, and it gives me great pleasure to see the subject is now on the *qui vive* in the literary world. The article in your last number, from the pen of Mr. A. Walker, is excellent as far as it goes, and it is to be regretted that so competent an individual did not enter more into the detail of his proposition.

It is a moral disgrace, a kind of general odium on the metropolitan gardeners, to think that while the tradesmen and mechanics have been forming their reading societies, debating clubs, mechanics' institutes, &c., &c., the gardeners comparatively have been slumbering. But in their extenuation, I may be told, there are gardeners' societies in the vicinity of London. True! I believe there are two; one at Acton, and the other at Stamford Hill, or somewhere thereabout; and I am also informed that there is a reading society connected with the establishment of Messrs. Low, at Clapham. And what have these societies done? Have they published a report showing the advantages of such associations? or have they held out any encouragement for young gardeners to become members? I fancy not, or it is more than probable I should have heard of it.

I have been at the meetings of the Acton Society several times, and, considering their limited means, and the short time the society has been formed, they have certainly got a very respectable library. But the advantages, I am sorry to say, are monopolised by master gardeners; for, as far as is known to me, there is not a single journeyman gardener connected with the society. But, not to descant too severely on a society that may be considered as yet "in the bud," and which I believe is the first society of the kind that has ever been formed in the united kingdom, I shall pass on to state what, in my opinion, ought to be the great principle of the new society. I deem it essential *that no respect be paid to persons—that gardeners of all denominations, from the head gardener to a nobleman, down to the apprentice in a commercial garden, be at all times admitted, and enjoy the same privileges.* This will appear a rather radical proposition, but it is the "great level" to which all who are desirous for the advancement of gardeners and gardening must succumb. I also think the society should be as much as possible a debating one, for it is an appalling fact, that in argumentative powers gardeners, as a body, are very deficient. It is not required that we should become regular orators (if we do, all the better), but it is absolutely necessary that we should be able to express ourselves on all professional subjects with clearness and precision; for, observes a recent writer in the "Gardeners' Magazine," "In addition to facility and correctness of expression, it is particularly advisable that an artist, in whatever department he may be, should possess a well-grounded and perfect controul over his own temper and feelings. By this self-command, united with a suavity of manners and firmness, he may often save his employer from falling into absurdities, and his own works from mutilation. We very well know that an opinion, when stated with gentleness and in a pleasing manner, does not appear the same as when arbitrarily advanced, and thrust upon us, as it were, by force. It is very difficult indeed to withstand truth, when it is supported by a mild and gentlemanly address. Prejudice almost always yields to it, and corrected ignorance retires abashed from the contest." And as it must be admitted that there are few professions so exposed to absurd innovations as Horticulture, it becomes necessary that we should prepare ourselves to meet such exigencies; and as such preparations can only be made by acquiring extensive literary knowledge, I hope we shall not any longer remain indifferent on the subject, but meet as a body and lay the stepping-stone of a society worthy of gardening and of the nineteenth century.

It is to be regretted that much dissension still exists among both old and young, respecting the advantages and benefits of book knowledge, some contending that, because there are some things that cannot be learned from books, we ought to give up books altogether, while others assert that *periodicals* have done much injury to gardening, and that they will ultimately be the ruin of its professors. Without entering into any formal refutation of such *sophistry*, I feel no hesitation in asserting that the present improved state of gardening is wholly due to the dissemination of knowledge through the press. Books are the very soul of improvement. "They enhance prosperity and alleviate adversity; they people solitude and charm away occupation. They, like flowers, equally adorn the humblest cottage or proudest palace. They can delight without the aid of selfishness, and soothe without the opiate of vanity; please when ambition has ceased to charm, and enrich when fortune has refused to smile."—It is books that enable us to—

" Sit and hold converse with the mighty dead,
Sages of ancient times, as gods revered,
As gods beneficent, that blessed mankind
With arts and arms, and humanised the world."

In the first Vol. of the *Register*, p. 677, there is an excellent article on "The advantages to be derived from the formation of a Gardeners' Society," by R. F., and as I have *reason* to believe that the same writer will again take the field, I shall not enter into any further detail, but leave the subject to his superior abilities, and in conclusion, I can only say that, as far as my humble abilities admit, I shall be most happy to render every assistance towards the formation and promotion of a society which has been long wanting, and in whose progress I foresee a new era in the annals of horticulture; and I am, Sir, yours very respectfully,

W. P. A.

The Gardens, Chiswick House, December 5th, 1835.

Sir,—For the information of your correspondent, Mr. Walker, or any other gentleman who may take an interest in such things, I send you a copy of the rules of a Gardeners' Society which was established at Acton, on the 1st of October, 1832. Up to the 7th of September last, the receipts of the society were 25*l.* 18*s.* 2*d.*, and its expenditure 25*l.* 10*s.* 7*d.* The meetings are held at a private house, for which is paid 1*l.* 10*s.* per annum, the rest of the money, amounting to little short of 20*l.*, has been expended in useful books.

Since the commencement of the society, papers have been read at the meetings by the members on the following subjects:—On the culture of Cineraria, Mignonette, *Primula sinensis*, Love Apple, Chrysanthemums, Grape Vines on the open wall (two papers), Horseradish, Sea Kale, Broccoli (three papers), Geraniums, Figs, Mushrooms, and Peach Trees; the cultivation of potatoes from seed, and on the formation and utility of an herbarium.

By a by-law passed in August, 1835, every member is bound to read a paper to the Society, in his turn, at the monthly meetings.

Any further information that you or any of your correspondents may require, shall be cheerfully furnished at any time by, Sir, your obedient servant,

JOSEPH STAPLETON, Hon. Sec.

Acton, December 12th, 1835.

Sir,—You will oblige me much by inserting the following short remarks in your Register.

I have been much disappointed in my expectations, having hoped to see F. F. Ashford continue his system of botany, which was very instructive to many young persons whom I have the pleasure of knowing, as well as interesting to myself. I hope F. F. Ashford has not been deterred from pursuing his benevolent design by the remarks from a *constant reader*, which were published in the Number for July, p. 263. I consider those remarks to be ill-judged, as Mr. Ashford would most likely have completed his short introduction to botany, for such I consider it, in a few following numbers, but which is now incomplete. I would not trouble you, Sir, with these remarks, had not some of your younger readers been disappointed; and hope that F. F. Ashford will be so kind as to continue his remarks on the Study of the Science of Botany, which I consider quite deserving a place, as it is, in fact, a very concise and easy introduction to Botany, which is so generally studied in the present century: and to my knowledge Mr. A.'s remarks have been the first stimulus to a few young friends of my acquaintance.

Yours truly,

Ιακωβος.

Derby, December 8th, 1835.

[In reply to the above observations of our correspondent Jacobus, we have to state, that Mr. Ashford's Botany was discontinued merely because it engrossed too many of our pages at that time, and also because many of our readers required more variety of practical subjects. The remainder of Mr. A.'s Botany is, however, still on hand, and it is more than probable that it will appear in an abridged form as soon as we can find room for it.—ED.]

SYMPHYTUM ASPERRIMUM ; OR, PRICKLY COMFREY.—A new species of green food for cattle. A hardy perennial of gigantic growth, introduced from Caucasus, as an ornamental plant, in 1801, by Messrs. Loddiges, of Hackney, as specified in Curtis's Botanical Magazine, where it is figured, No. 929. Horses, cows, sheep, pigs, and geese may be fed with it; and as it is of wonderful growth, and may be cut successively from April to October, it may be cultivated to great advantage. For horses, to be put in the racks, spread on pastures, or the green stalks to be cut with chaff, it will be found most useful. Two out of three will take it at once, the others will soon follow, and when once the taste is acquired, they will never leave it. Cows do not take it at first so freely as the horse, but soon take it and are eager for it. For sheep or lambs it is very good; they will take it freely, the latter before they are a month old. It is a very early plant, and immediately follows the turnips. The first crop of leaves to be fed off before the flowering stalks rise, care being taken not to feed too hard, so as to damage the crowns of the plants. Spread on pastures, put in racks or folds on fallows, it will be found of great service. For pigs it is very useful; they eat it freely and do well. Geese will eat it as soon as hatched. It will grow in all soils and situations, superior to any other plant, and may be planted by the sides of ditches, in any waste corner, fields, orchards, gardens, &c., where only useless rubbish grows. The only expense is, the purchase of a few in the first instance, as it may be increased to any quantity, and, once established, will last for ever. I know some that have stood more than twenty years, and are as full of vigour as they have ever been. It is now ready for cutting (March 31st). I have cut it when more than seven feet high, and as thick as it could stand on the ground. I once cut and weighed one square rood; the average was seventeen tons, three cwt. per acre. I have no doubt but that in the course of the year the produce would have been thirty tons. I cannot say what effect continual cutting may have on this plant, or on the land, for many years together; but as far as I have experienced, it does not weaken the plant. I have cut it three times in one year, and found it equally strong the following spring. The proper distance for planting it is from two to five feet square, according to the quality of the land. It may be planted at any time of the year, but, like other herbaceous plants, is best when in a growing state. See a letter to Lord Farnborough, signed Dr. Grant, in the Northampton Herald and General Advertiser, Saturday, October 10, 1835.

ON THE CULTURE OF THE DAHLIA.—In looking over the last number of the Register, I found a few remarks on the Dahlia worthy of notice. Before making any observations on the subject, I beg leave to state that there is a custom prevalent among the growers of that flower, to choose a particular spot for its cultivation, and beyond the limits of which it is but sparingly seen. The same spot is annually prepared with old hot-bed manure, or with some other compost, as convenience may suit; and as such situations are well chosen for seeing the flowers together, and to the best advantage, it should always be properly prepared for their reception, and for this special reason—a dahlia *should never be grown twice* in the same kind of soil. The plant delights in fresh maiden loam; and if the old spot be annually chosen for the collection, the soil should consist of at least two-thirds new soil, digged in two spades deep, and well mixed with the old. This is necessary for the plant, in order that the roots may have scope to descend in quest of moisture, so essentially necessary to bring their numerous flowers to perfection. Two advantages are the consequence of this extra labour; first, dry weather does not much affect them; and, second, the flowers are more perfect, as well in size as in colour. I would also recommend that, when dahlias are planted in borders, or in clumps of shrubbery, they be well covered from the rays of the sun, which is liable to scorch and injure the roots; the covering, moreover, assists to bring forth a profusion of bloom.

Chelsea, 14th December.

ANDREW WALKER.

P. S. The following are a list of the best dahlias cultivated by myself and an eminent grower in my neighbourhood:—

Lord Derby	Willmot's Superb	Forester
Metropolitan Blush	Fisherton Rival	Beauty of Camberwell
———— Perfection	Springfield Rival	Gloria Mundi
———— Calypso	Queen of Dahlias	Bride of Abydos
Solomon	Veitch's Adelaide	Cedo nulli
Purpurea elegans	Claude Lorraine	Coronet
Bishop of Winchester	Sir Francis Burdett	Mrs. Wilkinson
Granta	Wells' Aurea	Elphinstone's Polyphemus
Lilac Perfection	Ariel	Wells' Polyphemus
Lady Fordwich	Westland Marquis	Glory
Plat's Clio	Grandis	Sir Robert Peel
Vandyke	Rubra compacta	Othello
Richardson's Janus	Jackson's Rival	Perfection
Wells' Lady of the Lake	Highland Hero	Venosa
Alba grandiflora	Lady Anne	Hermione
Lady of Oulton	Richardson's Emma	Hon. Mrs. Harris
Wells' Enchantress	Cock's Invincible	

ON THE ASSIMILATING AND ELABORATING POWERS OF PLANTS.
 —Every plant with which we are acquainted contains some predominating specific principle, detectable to some one or other of our senses, and by which the individuals or whole tribes are known from each other. In speaking of the essential qualities of plants, they are designated sanative, or poisonous, or insipid; or, in other terms, they are dietetic, or medicinal, or necessary in the arts.

That these different vegetable qualities are elaborated by the internal structure or organisation of the plant, is sufficiently obvious; because the food of plants growing on the same spot must be very similar in quality, though it may differ in quantity. It has been supposed that every different plant selects its own peculiar food. This is possible, but not at all probable; because qualities and distinct chemical bodies are found in plants, which are found nowhere else. The most accurate chemical analysis of the soil in which plants are nourished, or of the water or air by which they are fed, never elicits the presence of the many qualities found in the plants themselves; and, therefore, we can only rationally conclude that it is the structural powers, united with the vital action of the system, which assimilates the crude food into the essential qualities of the plant; for if this be not so, how is it that the *Antiaris* or *Ipo toxicaria*, the Upas-tree, elaborates a deadly poison, while the *Saccharum officinarum*, the sugar-cane, growing close beside it, elaborates one of the most wholesome juices? Is either the poison or the sugar in the soil, or air, or water? We imagine not.

The essential qualities of every plant are inherent, and continued from generation to generation; but how the membranous structure which contains the juices, and under the action of solar light, and heat, and air, changes them from a crude to a perfect state, is one of those natural phenomena which will probably ever remain inexplicable. It is easy to surmise that pre-existing qualities may, by amalgamation, assimilate the newly inducted sap with the properties or peculiar qualities of the old. On a very different subject, it has been said that "a little leaven leaveneth the whole lump;" and the assimilation of the new with the old sap may take place perhaps in the same way.

When the elaborating power of living vegetable membrane is considered, we cannot avoid comparing it with the apparatus of the chemist. It is composed of innumerable cells, and tubes, and vessels, into and through which the juices enter and percolate, at a greater or less distance from the sun's light and heat, and, according to their

situation, may be variously affected by electric currents, or other of the great, though invisible natural agents. That exposure to air, light, and heat has a decided maturing effect upon the juices of a plant, is manifest from our finding the essential qualities, in most cases, more concentrated in the bark and leaves than in the interior recesses of the system; and every one acquainted with the qualities of herbs, and we may add, trees also, knows well that a dry and very exposed situation serves to exalt and enrich the essential qualities of any plant much more than in circumstances where air, and light, and solar heat are denied. Upland hay, cut at the proper season, is always richer in saccharine matter than that produced in the moist valley; and that from the elevated knolls of any one field is always much more salubrious and nutritious than the produce of the lower parts. The sap drawn from the highest parts of a tree is richer in quality than the same drawn from the lower part of the trunk. This fact is always experienced by the manufacturers of sugar from the maple, and wine from the birch trees. So it is noticed that fruit, as well as herbs, are found sweeter in a dry than in a wet summer; and the gardener always withholds water from his plants which are about to ripen their crops.

All these instances show that the sap is more or less elaborated, according as it is more or less exposed to atmospheric influences, to the character of those influences, and to the extent of the vascular apparatus through which it has to percolate.

It is well deserving of notice to mark the difference which is perceivable between the state of pure water ascending through dead and living vegetable membrane or tissue. In the former it is discharged as pure as it enters: in the latter it comes forth impregnated with the qualities of the branch or twig through which it has passed. This difference can only be attributed to the vital action of the one, and the want of it in the other.

A good example of the elaborating functions of plants may be shown from what chemists have discovered by the analysis of the common liquorice (*Glycyrrhiza glabra*), which, besides sugar, contains an amylaceous fecula, a crystalline substance, a resinous oil, phosphate of lime, and malate of lime; and it is highly probable that there are some plants which elaborate even a greater number of distinct essences than the liquorice.

That the organisation of every plant gives the essential character to the juices which it contains is manifest, from the circumstance that the sap absorbed by the roots, and conveyed by the stem of the stock, has

no sensible effect upon the juices, the colour of the flowers, or flavour of the fruit of the graft. It is true that this has been controverted; some cultivators having affirmed that the fruit, produced by scions of pears grafted on quince stocks, are more austere than if worked on the common seedling pear stock. But this idea wants confirmation, as it has never been so far verified as to cause any rule of practice to be founded upon it.

It is quite true, however, that there must be some degree of affinity, some measure of congeniality between the stock and graft to insure a perfect union: and this seems to depend more on the congenerous qualities of the sap respectively, than on those of the organisation; because we often see stocks and grafts very unequally though intimately united, either the stock swelling to twice the size of the graft, or *vice versa*. This not only shows that the sap is connatural, but that the organisation of the one is more gross than the other; and consequently, though both grow at the same time, one is more amplified than the other.

Viewing these observations in connection we arrive at the inference with which we set out, that all the various productions of plants, and which are extractable therefrom by one means or other, are elaborated by the organic structure and vitality of the system. This is a truism which scarcely requires a statement; but when we contemplate the vegetable kingdom, and consider every plant as a living *chemical machine*, by which sugars, oils, resins, gums, &c. &c. are generated and embodied, whatever may have been our previous ideas of the wonderful forms and powers of plants must be infinitely heightened by this consideration of them. Our purest and most grateful adoration may have been constantly offered to that benignant BEING who "giveth us all things richly to enjoy;" but how much higher must our conceptions be of the incomprehensible and Almighty Creator who hath not only *willed* all vegetation into form, but endowed it with such powers of elaboration, as by the combination of a very few precreated *fluids*, the most sanative, nutritious, and useful products are provided for all that lives.

A DESCRIPTIVE CATALOGUE OF ROSES, *cultivated and sold by Messrs. Rivers and Son, of Sawbridgeworth, Herts, for 1835-6.*

We announced the receipt of this catalogue when it came to hand, at which time we had not leisure to look into it; but having now done so, we think it but justice to Messrs. Rivers, the spirited cultivators, to notice it more in detail.

The rose is universally esteemed as the queen of flowers, in which the most delicate colours and the richest perfume are united. The French

florists have, within the last twenty years, greatly excelled in rose culture, and particularly in obtaining a vast number of new varieties from seed. They excel also in their modes of working and manner of pruning the plant; and so extensively is the culture pursued that it forms a distinct branch of nursery business.

We have often admired the perseverance of our neighbours in this department of floriculture, and have been surprised to see the number of distinct varieties which were named in their lists; but we had no idea that any one in this country equalled, in any degree, the rose-growers in the vicinity of Paris. The catalogue before us, however, shows that Messrs. Rivers have followed closely, if not fairly overtaken, the French roseaieists, as this published list of their assortment clearly shows.

The catalogue is not a mere rank of names. The sorts are arranged in groups, under their most distinctive characters; and much of their history, and the treatment they require, is given under each section of the tribe. The sections are, Moss Roses, Provence or Cabbage Roses, Perpetual or Autumnal Roses, Hybrid China Roses, varieties of Rosa Alba, Damask Roses, Rosa Gallica or French Roses, select Roses of uncertain origin, Climbing Roses, China Roses, Tea-scented China Roses, Miniature or Dwarf China Roses, Noisette Roses, L'Isle de Bourbon Roses, Musk Roses, Macartney Roses, Sweet Briars, and Scotch Roses. Besides these sections, Messrs. Rivers have miscellaneous collections, which are offered at very reasonable prices.

The catalogue is really a very useful monograph of the genus, and is well worth the notice of all lovers of this delightful and hardy tribe. "In again attempting a descriptive catalogue of roses," says Mr. Rivers, "I hope to be excused errors which it seems almost impossible wholly to avoid. Roses vary so much in their form and colour in different seasons and situations, as sometimes scarcely to be recognised. I have seen those two dark varieties, George the Fourth and the Tuscan, lose their colour and become blush; and changes as extreme take place in others. What I hope to accomplish is, to give an idea of what they ought to be in form and colour under favourable circumstances of soil and situation; and where there is so much confusion as at present in the names and arrangement of roses, to be among the first in attempting a correct nomenclature. This has become more than ever necessary, as auction sales often take place in London, in which good names are appended to the lots, which it is found afterwards the lots do not deserve. This should be a caution to cultivators against admitting such into their catalogues till they have proved their accuracy."

DESCRIPTION OF ROSES.—As a continuation of the foregoing notice of roses, we subjoin the following account from a late popular writer:—

“Numerous as the roses are, upwards of two hundred species being known, besides threefold that number of varieties, they are all so similar in structure that it has been found expedient to include the whole in a single genus. Various attempts have been made to subdivide the roses generically; but even the *Lowea* of Lindley, though differing in the organs of vegetation from the other species, cannot be regarded as more than a sub-genus; and hence *Rosa* stands alone.

“The species which affords the chief garden varieties is *R. spinosissima*, the Burnet rose, of which there are about two hundred double and single sorts; *R. Damascena*, the Damascus or damask rose, of which there are upwards of fifty sorts; *R. centifolia*, the hundred-leaf or cabbage rose, of which there are nearly eighty sorts, besides the very distinct group of moss-roses (*R. muscosa*), about seven in number (the Messrs. Rivers have twenty-four), which are varieties of this species; *R. Gallica*, the French rose, of which there are nearly two hundred sorts; *R. alba*, the white rose, of which there are about thirty sorts; *R. rubiginosa*, the sweet-briar or eglantine, of which there are eleven or twelve varieties, and several sub-varieties; *R. canina*, the dog-rose, of which there are seventeen varieties; *R. Indica* and *sempervirens*, the monthly and Chinese roses, of which there are about forty-nine sorts; *R. systyla*, *arvensis*, *sempervirens*, *multiflora*, *moschata*, *Banksia*, and others, contribute to ornament our gardens and enrich our roseries; and besides such as are traceable to different species, there are upwards of seven hundred sorts recorded in our catalogues, the specific connections of which cannot with certainty be traced.

“It would be as foolish to praise as to paint the rose; it requires no commendation. Perhaps from such a notion it might be that this flower was considered the symbol of silence; for we are told that the goddess Isis, and her son, Harpocrates, were crowned with chaplets of roses.

“Roses are intolerant of smoke, and hence they never thrive either in or very near large towns. *R. canina*, or the dog-rose, is grown for the sake of the succulent calyx-tube that invests its akenia, from which the conserve of hips, a pleasant pectoral medicine, is made. The petals of *R. Gallica* and *Damascena* are collected for the purpose of making infusions and a confection of rose petals, both much used in medicine. Rose-water and the attar of roses are both procured from *R. centifolia*. About six pounds of rose leaves will make a gallon of good rose-water; but from two hundred to two hundred and fifty pounds weight are required to yield one ounce of the attar; hence surprise ceases at its

being such a costly scent, and great inducements are held out for its adulteration.

"The petals of *R. Gallica* and *Damascena* are much less fragrant, when fresh, than those of *R. centifolia*; but the latter lose their scent, while the former become more odorous, by drying. They are likewise more astringent, and hence their official employment.

"*R. Banksia* is remarkable for having no prickles."—*Bur. Bot.*

CALENDARIAL MEMORANDA FOR JANUARY.

KITCHEN GARDEN.

Peas.—A pretty large sowing of Charlton, Warwick, or any other of the early sorts, may be put in early in the month; and another sowing of Dwarf Marrows, or Knight's Marrows, may be sown towards the end. These, with the sowings of next month, may be considered the principal crops. Peas do not require very rich ground; that which is in middling good heart is the best. Rich ground causes too strong a growth of straw, and consequently higher sticking than is convenient in a garden.

Beans.—Full crops of common beans may now be put in; the earliest sorts in the beginning of the month, and the later and larger sorts about the twentieth. Sow also on seed-beds for transplanting.

Shallots, &c.—These bulbs, together with those of garlic and rocambole, may now be planted, if not done before. Shallow planting is best.

Cabbage.—Transplant another piece of cabbage, to succeed those planted out in October.

Lettuce.—Transplant from the seed-beds, under glass, a good piece of coss-lettuce on well-digged, dry, and rich ground. An open spot is most suitable, and if allowed space, it will arrive at a large size, and be the first for use in the open air. Small beds of each sort may now be sown, to furnish plants for future transplanting.

Radish.—As early in the month as possible sow a principal crop of radish, to follow those raised on hot-beds. A dry border, lying well to the sun, is the best situation. The ground is divided into as many four-feet-wide beds as may be required for the family, with fourteen-inch alleys between. The seed is sown pretty thickly, and the surface raked smooth, and lightly patted level with the spade. A covering of short dry litter is immediately put over the beds, four or five inches

thick. When the plants appear, the covering is raked off into the alleys every mild sun-shiny day, but always laid on again before dark. While uncovered, they must be guarded from the finches, which are fond of the seeds. The covering must be employed till all risk of hard frost is over, even up to the time the roots are fit for the table.

Spinach.—A bed or two of spinach should now be sown, to succeed the winter crop, which latter, if the spring be fine, soon runs to seed.

Carrot.—A small piece of Early Horn may be sown, to come in between those raised on a hot-bed, and the principal crop to be sown in March. Some gardeners sow their radish and this sowing of carrots on the same ground, as both are the better for covering, and the carrots will come on after the radishes are drawn.

The cauliflower, lettuce, and all other plants in frames, will require attention, at this time, to be kept healthy and safe from frost; and hot-beds in work require constant care to maintain the necessary heat, and give the necessary protection.

Regarding hot-bed forcing, it is quite superfluous to give anything like directions for their management at this season. To those who know nothing of the business, our calendarial advice would be of little service, because we are necessarily ignorant both of the state of the beds, and of the plants upon them, and without a knowledge of both, no sound advice can be given. On the other hand, those who are actually employed in such business need no advice from a distant quarter. The whole use of this portion of the Register is only a general remembrancer of the seasonal duties of a gardener, and which mementos, by-the-by, are very often useful even to the oldest and most practised hands.

Forcing cucumbers, melons, asparagus, carrot, potatoes, sea-kale, rhubarb, and all sorts of salad and seasoning herbs, are probably simultaneously going on in dung hot-beds, all requiring a world of care, skill, and vigilance, which must be redoubled if frost be intense, or snow-storms prevail. In such seasons, all the out-door work which we have alluded to above, must be deferred until the return of open weather, in which the first favourable opportunities must be seized to accomplish the several operations.

FRUIT GARDEN.

In this department there is nothing but executing what was advised to be done last month, in the open air. If vineries and peacheries are

begun, or about to be begun, these "bring their work along with them," which is unnecessary to point out. The pinery, too, is a constant object of attention, and especially if the successions are raised on dung-heat—a custom which is now very prevalent.

FLOWER GARDEN.

The business of the flower garden is very light at this time. The directions given last month are equally applicable now. Chrysanthemums, in the open ground, have bloomed beautifully this season; and the great number of new varieties now in cultivation ranks them as one of the most estimable of autumn flowers. The Green-house only requires to be kept free from damp and frosty air. Bulbs, tubers, roses, rhododendrons, &c., and all other plants in pots, wished to bloom early, may be now put into heat.

DESCRIPTION OF PLATE.

RODGERS' UNIQUE GOLDEN CRIMSON BIZARRE CARNATION.

THE first notice we had of this very beautiful flower was received from our valued correspondent, Mr. Dale, of Wirksworth. On receiving the drawing, we were forcibly struck with an idea that we had seen something of the kind before. This impression did not arise from any doubt we had of either Mr. Dale's judgment or veracity, nor from any overweening idea of our own opinion in these matters, for on showing the drawing to a very intelligent florist, he had a similar idea with ourselves. After many inquiries, however, and an examination of the late Mr. Sweet's "Florist's Directory," (the work in which we expected to find the figure above alluded to,) we found ourselves mistaken, there being no such figure, which was sufficient proof that Rodgers's plant is indeed a unique variety of carnation. It is certainly a stranger about London; the nearest approach to it is one of the lately introduced yellow picotees.

We shall be glad to have a further history of this interesting plant from Mr. Dale, who will be kind enough to say with whom it originated, whether it can be purchased, and at what price.

REMARKS ON THE WEATHER

FOR DECEMBER.

FROM the first to the tenth the weather was beautifully mild ; and while the now numerous varieties of Chinese Chrysanthemums were ornamenting every garden and court-yard about London, and market-gardeners sowing their first crops of radish, reports were received that sudden frost had not only arrested some of our whalers in the North Sea, and frozen the upper part of the Baltic and the Russian rivers, but was also ravaging the vegetation of Germany, France, and even that of Spain ! On the latter-mentioned day, however, winter set in with a vengeance : the thermometer fell above fourteen degrees below the freezing point, which laid all tender vegetation prostrate. The frost was equally severe on the eleventh, but soon after began to relent, and passed away without snow or any rain to speak of.

This sudden visitation has given opportunity to fill the ice-houses, and has put gardeners on the alert to protect vulnerable crops, and also put them on their guard against future attacks, which every day may be expected ; for though we have had frequent changes from sharp to mild air since the frost—and changeable weather is always expected in the last quarter, or about the change of the moon—yet the present direction of the wind, blowing keenly from the north, the threatening aspect of the sky, and the cheerless face of the earth, at this moment partly covered with snow, are all indications that winter is confirmed, and therefore frigidities and the festive comforts of the season must enable us to wait with patience the return of spring.

December 20th, 1835.

PAXTON'S
HORTICULTURAL REGISTER,
FEBRUARY, 1836.

HORTICULTURE.

ON THE SHRIVELLING OF GRAPES.

January 5th, 1836.

SIR,—IN reference to the “shrivelling of grapes,” I beg leave to add a few remarks to those of Mr. Denyer, not only with the view of supporting his statements, but also to mention the result of my experience, for the benefit of my “younger brethren.”

A range of houses was placed under my care some years ago, where the grapes produced had been bad coloured and shrivelled. I forced them two seasons, and, although those berries which did swell were well coloured, yet the extremities of the bunches shrivelled. Mr. Judd had stated in the “Transactions,” that inattention to airing the houses was the cause. Several gardeners of high repute, to whom I mentioned the circumstance, were of the same opinion. As, however, I had been duly initiated into the routine of forcing, and had attended to these houses myself, I knew the imperfection could not arise from any such cause.

From several observations I had made, very similar to those mentioned by Mr. D., I came to a similar conclusion, viz. that it originated in a want of energy in the root, and which, as he has justly stated, might arise from a variety of causes. In my case, I conceived it to arise from a poor, cold border. The border, I was informed, had been duly drained when it was made; but, as the situation of the garden was low, and the subsoil strong clay, and an excavation having been made for the border, it was not difficult to understand that the roots must suffer from

cold. Moreover, the border was shaded by a row of espalier trees, which grew a short distance from it. I had not the opportunity of raising the roots to the surface; I therefore removed the apple-trees, lowered the walk at the front of the border, and, as the stems outside of the house were naked, I laid a covering of decayed leaves and dung on the surface. By these means the roots were ultimately acted upon by the genial rays of the sun. *Within* the houses, I left but a thin crop of grapes, and a limited supply of wood for the succeeding year. The result was most satisfactory.

My usual practice now is, to dress the border every *summer* with decayed leaves and a little loam. In a cold, wet season, I leave but thin crops; in a dry, hot season, good crops. When the latter is the case, I supply the roots with water most abundantly, without any fear of paralysing their efforts. The grapes produced are generally admired for their size, colour, and flavour.

To *young gardeners* I would say, do not be too anxious for a great crop in your *first effort*. Endeavour to ascertain the capabilities of your vines. Attention to the ripeness of the wood and the circumstances of the place, will very much assist you in this particular. If you are required to make new borders, elevate them as much as you conveniently can, particularly if the site be low and damp. A bed of compost from eighteen to twenty-four inches is quite depth enough. Extend the roots horizontally, as much as circumstances will admit.

To *gentlemen* may I be allowed to say, desire to have good fruit rather than great abundance: make every allowance for local circumstances, and the natural difficulties your gardener has to contend with. Do not place implicit reliance on the writings or the sayings of any man, merely because he has obtained a degree of notoriety;—many write and talk from no other motive. Mr. Judd, I fear, is amongst the number. Why, every gardener of ordinary observation knows that when the “cuticles of the berries” are acted upon by the sun’s rays, it is by the concentration of the rays acting like a burning-glass, and injuring only the part where the focus strikes: hence we see the side next the sun injured—the other side perfect. I have, indeed, known grapes really scalded by vapour heated to a great degree; but that is a very different thing to the “shrivelling of grapes.”

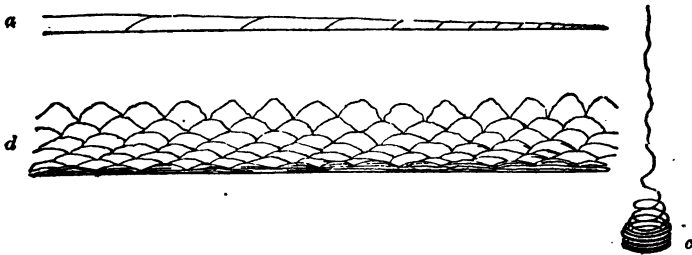
As far as I have observed, when grapes are injured from external causes, the *berry* discovers it first. In the “shrivelling of grapes,” the defect is first exhibited in the pedicle.

G. P. R.

ON THE PHYSICAL STRUCTURE OF PLANTS.

THE physical frame of vegetables assumes very many different characters as to consistence, structure, and durability. In its simplest form it is composed of a tissue of small cells, united together by mutual attraction, or, as it would appear, by a portion of mucus with which their sides are covered. This mucus is dissolvable in water, because, when thrown into it, the cells separate from each other, and float singly. The arrangement of the cells is different in different plants, or to the form or function of the organ they compose. These organs are either fibres, or delicate webs, or tubes, all of which are variously placed, either vertically, obliquely, or horizontally.

Fibres in their simplest state, as seen by the assistance of a microscope, are formed of elongated cells, united by their ends overlapping each other as in fig. *a* :—



These are sometimes single, but frequently are arranged in bundles, where greater solidity or strength are required. Sometimes fibres are disposed spirally, involving an empty centre, in which state they are called spiral vessels, and are found in almost all young shoots.

Fibres give tenacity to the membrane, and form the longitudinal grain and transverse strength of timber; they are elongated by the development of the cells of which their solid points are composed, fig. *a*, or by unrolling the spiral coils in which they are depressed, fig. *c*. In their more or less aggregated state, they form the tough laxity of the petioles, the substance of the midrib, and all the ramifications of what is called the nerving or veining of leaves.

Webs.—The cells are also expansible into thin tissues, by lateral attachment and mutual insertion of their pointed ends, fig. *d*. In this state it is seen as the cuticle of stems, leaves, and flowers, or like those transparent films which invest the coats of the onion bulb. Sometimes

the cells form layers of considerable thickness, and are united like a honeycomb, either in a vertical or horizontal position. The inner bark or liber is a tissue of fibres and intermediate cellular matter united, and discharged from the current year's alburnum in the autumn. This is so regularly beautiful in some trees, that it resembles the finest Brussels lace; the fibres in crossing each other are inosculated, and remain connected after the accompanying cells have disappeared.

Tubes are formed of conjoined cells placed in circles, strengthened lengthways by fibres passing upwards through them; they (the tubes) are sap-conductors, or receptacles of gaseous fluids or common air.

The woody axis of a tree is formed by these different organs combined, the fibres and the tubes having a vertical, or at least a direction from the root outwards, and the cellular fabric lying in horizontal strata between.

The elementary matter of which the membrane or coats of the cells are formed, we cannot name, it being a compound substance formed by the union of several chemical bodies, its normal structure being endowed with the wonderful power of subdivision and extension, and changeable from a small mass of succulent membrane up to a considerable volume of ligneous matter, and by annual accretion arrives at a vast bulk. It is a creature of Almighty power and Omnipotent design, no less astonishing in its organic forms than in its organic action.

The manner of accretion by extension of vegetable membrane is most wonderful. The elongation of a fibre takes place by the consecutive enlargement of the cells from the base upwards, there always remaining at the point an interminable number developable in future, or as long as the growth continues, as represented in fig. *a*, page 43. A tissue or web is expanded by the enlargement of the incipient cells lying in the inner edge of the margin, or hem, as it may be called, and in which hem there also appears to be an indefinite number of expandible cells, which may or may not be inflated, fig. *d*, page 43. The tubes or openings seen in a cross section of a stem, (not the spiral vessels already mentioned,) appear to be incidental passages, formed by the currents of sap or air passing through them, rather than identical organs of themselves, seeing that they have no regular boundaries.

Besides the longitudinal organs of a stem already alluded to, there are other very conspicuous members which enter into its composition; these are what are commonly described as medullary rays, and have been supposed to be the diverging tracks of buds from the pith to the exterior of the bark; but later observers have discovered that they are, in fact, convergent partitions of dense cellular tissue, which divide the circum-

ferent layers of wood into angular sections. Their use is to connect the concentric layers of wood, and perhaps to admit or allow the passage of fluids from the circumference to the centre of the stem.

Vegetable membrane varies not only in consistence, but in durability. The lower orders of plants are mostly cellular, that is, composed entirely of simple cells, without fibres or elongated vessels to give them either tenacity or durability. Their growth is rapid, and they as quickly disappear by decomposition in the open air. But the membranes of vascular plants become woody, and, when the cells are filled with concreted sap, remarkably durable, more especially when converted to use, and kept free from the action of the weather; even some of the *cellulares*, as the fungi, for instance, if gradually dried and kept free from moisture, will retain their form for a great number of years; and many of the *musci*, if kept in a dry and dormant state for scores of years, will recover vitality as soon as they are moistened with water. This is only mentioned as a proof of the durability of vegetable membrane, even in the lowest grades of plants.

When we turn to the vascular dicotyledonous tribes, we find many instances of extreme ponderosity, hardness, and durability; so weighty that it will not swim, as *lignum vitæ* (*Guaiacum officinale*), and which may be instanced also as an example of both hardness and durability, even when buried in the earth. Both box and yew timber are remarkable for their closeness of grain and lasting properties, both while the trees are standing, as after they are felled. Oak timber is very durable, and so is that of many of the *coniferae*. Solidity is acquired by the closeness of the cellular and vascular structure, as is exemplified in the sorts of wood above named, and if the fabric be well filled with coagulated juice, ponderosity will be added.

But another question has been mooted; it is, whether the durability depends on the density of the grain, or on the qualities of the sap it contains? The durability of pine timber evidently depends on the slowly evaporative and preservative quality of the sap. The same, perhaps, may be said of oak, not, indeed, from the resinous character of the sap, but from the styptic and tanning principles contained in the heart-wood itself.

Experiments have been made on different kinds of timber, by submitting small portions of them to the action of an acid menstruum. The least durable is soonest decomposed; the parenchymous or cellular parts are first dissolved, and the fibrous tissue remains, and is last destroyed. By this means beautiful skeletons of slips of wood, seed-vessels, and leaves, are readily obtained. It has been said that a

slip of the Brazil wood, tried by this test, came out as colourless, light, and fragile as a piece of willow.

In the government dock-yards they have machines for proving the strength of timber, in order to estimate its comparative value or fitness for particular purposes. Scantling of three or four inches square, and three or four feet long, are laid on two immovable props, somewhat less distant from each other than the length of the pieces to be tried ; weights are heaped upon the middle of the piece till it breaks ; the flexure and number of pounds' weight under which it breaks being noted, is the proof of its comparative strength. This, by-the-by, is proof of the toughness of the timber, rather than of its durability, because it is well known that in many kinds of timber the latter property may exist where the former is wanting. *Lignum vitæ* and ebony are very lasting, though fragile ; bamboo is both very flexible and very durable ; willow and ash are flexible, but by no means lasting.

Cleft scantling is always found more durable in the open air than that which is sawn ; the reason is, the saw dismembers the grain, while the wedge does not.

Timber, particularly oak, is found of very different quality when brought to the artificer ; the heart-wood is only valuable. This has had time to become as compact as possible, and to be thoroughly impregnated with its peculiar tanning principle. The alburnum or white wood of oak is the least durable of any ligneous production, and therefore is always slabbed off as useless for any permanent purpose. Much has been written on the cause of the inequality of oak timber ; indeed it has become a question of very great national concern. While beams in ancient cathedrals, piles of ancient bridges, and even the timbers of stranded ships which have lain buried up for ages, are found as sound as ever, some of our lately-built and noble ships of war have been condemned, or have required extensive repair, ere they left the stocks.

Many conflicting opinions have been offered as to the cause of this misfortune ; in general it has been alleged that the oak lately used in the king's and merchants' yards, has been prematurely felled, or used before it has been properly seasoned. Others suppose that the old English oak (*Quercus navalis*, *robur*, or *pedunculata*) has been partly banished by a spurious variety, of similar appearance, but of far less value as timber for ship-building ; and, to guard against this unfortunate substitution, it is only necessary to observe, that the " true naval oak is easily distinguishable from the others growing wild in Britain, by the acorns being seated on long stalks, and the leaves sub-

sessile, or without any ; while the inferior oak has sessile acorns, and leaves with lengthened foot-stalks."—*Burnett*. Figs. *a* and *b*.



Others believe that it is the soil on which the tree grows which imparts the durable quality to the wood ; and hence it has been said that, unless oak grows on land having a substratum of blue clay, or loam strongly impregnated with iron, the timber will be inferior. The same opinionists add that, since it has been so much the fashion to plant oak for the embellishment of country seats and improvement of estates, and, consequently, on all kinds of well-prepared soil, whether fit for the tree or not, has been the cause of much worthless timber being thrown on the market.

There is yet another idea on which some very able arboriculturists have differed, and this is relative to the quickness or slowness of the growth. One maintains that the quicker the tree arrives at a marketable bulk, the better the timber will be both as to strength and durability. A directly opposite opinion is held by others, who say that the slower the growth the closer the grain ; and, of course, they think that the timber must be at once both more solid and more ponderous.

Ship-builders and carpenters have been applied to to decide this question, but they, knowing nothing of the growth of trees, were incompetent judges. Timber-dealers and purveyors of timber for the navy seem to lean to the first opinion, namely, that wherever the trees grow most freely, there the finest timber is met with ; and they mention several districts of heavy land where the finest oak is grown.

That the quickest grown timber is coarser in the grain, is very obvious, and that it is also stronger and more durable, is highly probable, because it is the amplitude and consequent strength of the fibrous tissue which constitutes the excellence of timber, and not the cellular portions, which, though they are more dense, and work more mildly

under the plane, are, nevertheless, sooner decomposed *, whether in an acid or by wear and tear in a ship.

Another cause has been found for the modern inferiority of all timber used in buildings, viz. the more-than-ever prevalence of the dry rot (*Merulius lachrymans*); for it is by this despicable plant that many fine ships and noble buildings have been ruined, and their timbers committed to the flames. This plant is extremely variable in its appearance, often resembling a thin layer of cotton. The fructification is rarely developed;—when perfect, the sinuosities of the under surface are not excelled in beauty by any work of art or nature. Drops of clear water stand in the sinuosities like tears, and hence the specific name. The roots, or rather the branches of the plant insinuate themselves into the interior of the wood, bursting every cell, and decomposing every fibre in their progress, to live on—it is supposed, the half-elaborated sap remaining in the vessels.

Various preventives of the dry-rot have been recommended and tried with more or less success. Whatever was known to be inimical to vegetation was applied, as hot lime, salt, &c.; but as it could be only the exterior of scantling that was impregnated with these applications, the central parts were still a prey to the *Merulius*. Mr. Kyan's preparation of timber for using in places liable to the rot, maintains its celebrity in public estimation; but there are some doubts of its effects on the health of the crews of ships in warm latitudes;—this, however, remains to be proved; in the meantime, it is a most useful invention.

Timber is apt to rend, if sawn up and put to use too soon. The aqueous portion of the sap is gradually exhaled, and as this escapes, the timber shrinks. We have known elm cut up into weather-boarding for a barn, continue shrinking for twenty years after being put up. This shows that timber should be seasoned slowly, and, if possible, in the shade.

LANDSCAPE GARDENING.

LETTER EIGHT.

MY DEAR SIR,—Although the substance of my last, the present, and perhaps that of my two or three next letters, be not in strict accordance with the title under which they are written, yet, as I have

* The cellular partitions in pine timber are more durable than the vascular parts, because they are fuller of concreted resin.

before told you, every particle of information which I can pick up during my sojourn here is particularly interesting to myself, I hope the trouble I am imposing on you of reading dry practical matter relative to gardening or other rural affairs, will not be deemed irksome, especially if you be pleased to consider that gardening and farming are sources whence flow most of the substantial gratifications of a country seat. Indeed, without these, the most attractive and beautiful dispositions of the landscape gardener are no better than a set of fine pictures hung upon a wall; and that garden artist or architect who designs the one without a special regard to the others, must have a very imperfect idea of his business; in short, is altogether unfit for the profession.

At the end of my last we were just about to enter the hot-houses; the first, at the east end of the range, is the pinery, a building calculated to fruit about four dozen of plants. It is heated by a smoke flue and common furnace, placed in a shed behind. Some pains have been bestowed on building the flue, in order to equalise the evolution of heat. The first part, which crosses the east end, is built with building bricks on bed; the front with the same on edge; the farther end, and three turns against the back wall, are built with paving bricks on edge. The cross flues are carried through the front wall, but stopped there by a stone slab, for removal, to cleanse the flue of soot. The front and back flues are similarly fitted with stones at the end. The bark pit is four feet and a half deep, surrounded with a thin wall of brick-work, and finished with a stone curb. Tanners' bark is the fermenting material used in the pit, and is sometimes mixed with oak leaves to qualify the heat.

Single grape vines are trained under each rafter, and managed in the alternate long-shoot manner; that is, each tree has, during the summer, only two branches or shoots; one bearing fruit, and the other shooting up alongside to take its place, and do a like duty in the following summer. When the first has yielded its crop, it is cut away, and its substitute takes the place. At the commencement of the next year's growth, a successor is chosen from among the buds which spring from the head of the old stem, and as near to the base of its predecessor as possible. Soon as the choice is made, all the other buds offering themselves at the same time are rubbed off, in order that the fruitful branch and young aspirant may engross the whole vigour of the root. During its summer growth it is carefully kept in place, and regularly divested of tendrils, and the points of the laterals, which are pinched off above their first joint. The young shoot, so treated, rises to the full length

of the rafter, and, if its growth be very strong, is turned a little way horizontally and stopped.

When the fruit is all gathered from the bearing branch, it is immediately pruned off close to the place whence it proceeded the year before; and when the foliage on the successor begins to wither and fall it is pruned. The apparent strength of the shoot and its perfectly ripened condition, (which is judged of by the firmness, the hardy brownness, and short-jointed character of the wood,) are the indications which direct the pruner as to the quantity of fruit which may be reasonably expected from it in the ensuing year. He has the entire power of the root to rely on, there being no rival but the young successor to be supported. But lest he should estimate the capability of the tree too highly, he thinks it best to err on the safe side; and therefore thinks well to deprive the shoot of two-thirds of its buds at pruning-time. By this mutilation he confines, or rather compels, the tree to perform only one-third of what it is naturally inclined and constitutionally organised to do, and thereby insures a perfect and vigorous development of the reserved buds. Add to this the advantage of a regular distribution of the energy of the vine by this dis-budding; because, by retaining number *one*, which is the topmost after the shoot is shortened, (say to somewhat less than the length of the rafter,) and numbers *four*, *seven*, *ten*, and so on, all the way to the bottom, exactly one-third of the buds will be left, and these alternating right and left with each other in the utmost regularity.

It is very seldom that a shoot so treated fails to break all the way down; the topmost buds certainly burst first; but they being immediately stopped beyond the second bunch of fruit, do not continue to pump up the sap from below, and rob the lower buds. Besides, if the gardener suspects anything of the kind may occur, he prevents it by bringing down the feeble shoot from a vertical to a horizontal position, along the bottom of the rafters, and keeping it there till all the buds are moving, when it is returned to its proper place under the rafter.

As the buds burst and the fruit bearers have gained the length of four or five inches, the tender bunches soon appear; they are then closely watched, and as soon as two or three are visible, the point of the shoot is pinched off above the first joint beyond the fruit. And here the judgment of the manager must be exercised, in apportioning the crop to the probable capability of the tree: if he thinks two bunches enough on every shoot, he leaves them; but

if the vine be full of power, he allows three to be matured. By thus stopping every bearing-shoot, and pulling off every barren one, (except the succession, which is also encouraged by the same stopping,) the whole remaining strength of the vine is thrown into the scanty foliage and the crop, which last is thereby brought to the greatest perfection.

The next manipulation to which the trees and crop are subjected, is stopping every sign of unnecessary growth from the bearing shoots or elsewhere, and thinning the bunches of redundant berries when they are about the size of peas.

This is a tedious though necessary business, and particularly so in a pinery. The fruit, however, is greatly improved in appearance as well as in flavour by the expedient.

The culture (in regard to the degree of heat and moisture) of the principal crop in the house, namely the pines, does not differ much from what is necessary for the vines. If there be sufficient bottom heat in the pit, general watering over head is as necessary for the pine plants as it is to prevent the attack of red spider (*acarus*) on the vine. A damp atmosphere is necessary for both, provided there is sufficient heat and fresh air given at the same time. The pine delights in a warm and moist, and rather shady atmosphere while the plants are increasing in bulk; but when the fruit is ripening off moisture should be withheld: and this agrees with the vines, which, generally, are ripening their fruit at the same time.

Having given you a particular account of the management of the vine in the pinery, I must now advert to the management of the pines. This I shall do, as nearly as I can, from the information derived from the old Gardener, who is my special preceptor in all these practical matters, and I shall quote his words as nearly as I can remember them.

The celebrated pine-apple plant (*Ananassa sativa*) is said to be a native of South America, and in its culture here it is indispensibly necessary that the heat of its native climate be afforded to encourage its growth and mature its fruit. The plant sometimes ripens seed, by which new varieties are produced, but new sorts are very constantly being introduced from the West Indies. When a stock of plants is once obtained, it is easily kept up by young viviparous progeny produced by the old plants.

Each fruit bears at least one crown, sometimes several, as well at the base of the fruit as on its apex. The principal or largest of these are sometimes nursed up to be fruiting plants; but the chief dependence for young successors are the suckers which rise from the base of the

stem, at the same time the fruit is ripening, and when the latter is cut, are very soon after separable from the mother plant.

Suckers are generally preferred to crowns, because they gain bulk sooner, and of course are sooner ready to yield fruit; and besides, strong suckers are often partly rooted before they are dis severed from the parent, especially if some of the lower leaves from among which they rise be pulled off, and the bases of the suckers be covered up with sifted bark, or, what is better, fine loose leaf-mould. It is an old custom to allow the fresh wounds of both suckers and crowns to become dry before they are placed in pots of soil to strike root; but as this causes a loss of time, the drying period should be short; and indeed is, perhaps, not at all necessary if they be at once stuck into dry sifted bark or leaf-mould on a suitable heat. Sometimes they are partly rooted on the bark-bed among the old plants; but the regular course is, soon as the requisite number of suckers are selected, they are potted in small pots and plunged in old bark on a dung hotbed previously prepared for them.

There is no succession pine-stove at this place, the gardener preferring to raise all his succession plants on dung heat, which, he says, expedites their growth and keeps them free from the different kinds of noxious insects to which the pine plant is liable in dry heat. Very small pots are first used, and the plants are shifted frequently into larger and larger till they are large enough to go into the fruiting house. Fresh hotbeds are also made from time to time for their reception as they advance in size, and linings are constantly applied to keep up a lively bottom heat. Indeed, from the time the plants are first potted in the summer up to the first of March following, they must be kept constantly excited to grow vigorously by every kind of means. A bottom heat varying between seventy and eighty degrees, is always maintained: and the air in the bed never below sixty, to which it is kept by coverings on nights, and when the sun shines the temperature is raised to eighty degrees, and kept at that by giving air on all such occasions. A lively bottom heat, constantly maintained, is the chief point to be attended to; for while this is kept up, copious waterings may be given without fear of injury, and which at the same time creates that fine humid heat which is so favourable to the plant. Another thing: the steam arising from a dung hotbed, impregnated as it is with a considerable quantity of ammonia, so hurtful to almost all other tender vegetation, appears to be even nourishing to the hardy foliage of the pine plant; and hence the practice of rearing the successions on dung heat.

As the original ball of earth in which the crown or sucker was

planted, is increased in size at each subsequent shifting, cultivators have made it a rule to release the roots from this exhausted soil, in order that the plants may produce a new set in fresh compost, to enable them to take a renewed growth during the summer, and be fit to go into fruiting pots in the following October. This is performed about the beginning of March, by shaking off all the old ball of earth from the roots; and at the same time cutting away all the dead roots and a part of the dead bottom of the stem. If there be any new active roots, they are preserved, and a few of the bottom leaves are pulled off to permit the ejection of new roots, which are always produced higher and higher up the stem, and on which the future growth entirely depends. Thus relieved from the old ball, the old useless roots, and some of their bottom leaves, the plants are repotted pretty deeply in rather smaller pots, and in previously prepared good fresh loam mixed with one-third good rotten dung, and immediately replunged in a fresh bed made to receive them.

Here they receive the ordinary attention and necessary culture, namely, the proper bottom heat, water always according to their state of growth, fresh air, and necessary covering at night.

About the first of October, the fruiting house is got ready by turning and sifting (if necessary) the old bark, adding the requisite quantity of new, so as to raise the bed about six or eight inches above the curb. As the plants are shifted for the last time into the fruiting pots, they are brought and plunged at proper distances in the pinery to produce their fruit.

A few general observations remain to be added relative to the pine plant. Constitutionally it rises from a seed, a sucker, or a crown, developing its leaves in succession, by the assistance of new sets of roots, which consecutively proceed from stations higher up the stem, the first leaves and roots as regularly dying off. When arrived at a certain stage of growth, the fructification appears, and at the same time living progeny, in the shape of suckers, &c., are produced to continue the species. Time, or the age of the plant, has no effect either in accelerating or retarding the appearance of the fruit. A small young plant of only a few inches high, if its exterior members be either chilled by cold, or scorched by heat, will be immediately thrown into fruit, and thereby become useless. It is this constitutional peculiarity of the plant that renders pine-forcing a matter requiring the application of considerable skill and great attention. And in the process the grand object is to force the plants into the greatest possible size, in order to yield full-sized fruit in the shortest possible time.

The gardener finds the old Queen to be one of the most tractable of

the many varieties now in cultivation; and of course a great majority of his stock consists of Queens. He has, however, a few later fruiting sorts, as the Black Jamaica and Montserrat, to come in after the general crop is over; and if he wishes to have a few start early, he refrains from disrooting them at the time the rest of the collection undergo that manipulation.

You cannot fail to observe that twenty-four calendar months are required to grow and fruit the regular crop, so that pine culture is a continual round of labour and attention; for even in the heat of summer, this tropical plant may be hurt by too much sunshine, and mid-day shading is necessary. It is for this reason that the eastmost division of the range of hothouses is chosen for a pinery; the higher roof of the vinery intercepting much of the afternoon sun from the interior of the house.

We step out of the pinery into the vinery, a house of larger dimensions, particularly in length of rafter or slope of the roof on which the vines are trained to a wire trellis. The border for vines, both of the vinery and pinery, is made upon a bottom of compact, dry gravel, eighteen inches from the surface. The soil of the border is composed of mellow loam, road-sand, lime-rubbish, leaf-mould, and old hot-bed dung intimately mixed together. The border extends outwards from the front of the buildings, above twenty feet, so that the walk, &c., is made over part of it. And this circumstance the gardener thinks no detriment to the roots which may pass beneath; on the contrary, he imagines that the sun's heat, attracted and retained by the surface coat of gravel, is rather grateful and stimulating to the roots than otherwise.

The vines are planted on the outside of the front wall; the stems being led through openings close to the surface, and raised to the trellis within. One plant is placed to each rafter, so that each individual vine occupies a space of the roof equal to the distance between the rafters.

By introducing so many plants, two or three advantages are gained. In the first place, a greater variety of sorts is obtained; secondly, a more lengthened vintage; and, lastly and principally, each tree being confined to a moderate space, and consequently to a limited extent of bearing wood, none of the trees are ever weakened by maturing a full crop, nor does the growth of the head ever demand more nourishment than the roots are always able to supply. It is a rule which is applicable to all fruit trees, and particularly to the vine, that the supplying powers of the root should be always somewhat superior to the demands of the head, whether those demands be for the

mere extension of the branches, or for the support of a crop of fruit. It is for this special reason that the growth and crops of the trees I am describing, are always kept subordinate to the roots on which they depend.

The manner of pruning the trees here is very different from the method pursued in the pinery. Each tree has either three or four of what may be called principal branches, which are led directly up to the top of the house. This length they have gained in former years; and when they rise inconveniently high, they are cut back to the next promising branchlet below. These principal branches are not naked, but furnished with lateral branchlets, about fourteen inches apart from each other, all the way from bottom to top. These branchlets have been formed by the skill of the pruner in bygone years. They are the bearing parts of the tree, their points being every year extended by portions of bearing shoots; and when they interfere, the knife makes an opening by preferring the shoots rising from below.

This method of pruning, is not exactly what is called "*spurring in*;" it is rather what may be called *long-spur pruning*, as no particular length of shoot or number of buds at the base of it, are fixed on as a rule in pruning the trees. The size and appearance, together with the space it has to occupy, determines what should be done by the knife; the number and lengths of the shoots left to bear, are always apportioned to the known ability of the tree, and so as to have an equal distribution of the fruit over the whole trellis.

The summer management of these trees consists in stopping every shoot as soon as it shows two or three bunches of fruit, and at the joint beyond the uppermost bunch. All tendrils are also displaced, as well as every unnecessary shoot; the bunches are also carefully thinned.

The vinery is never forced early; and always very moderately. The trees are frequently and forcibly washed with the engine before they flower, and very frequently afterward, up to the time the fruit begins to change colour. Washing healthy vines, besides keeping them free from the red acarus, can never do harm, provided they have always heat and fresh air enough. Yours faithfully, A. B.

ENTOMOLOGY.

SHORT HISTORIES OF INSECTS HURTFUL IN GARDENS.

THAT some knowledge of the insects which prey and breed on plants is necessary in gardening, no one will deny; and to be able to distinguish those which are injurious from others that are really serviceable,

is a useful portion of knowledge. Many have an idea that all insects are hurtful, and, therefore, are doomed to destruction wherever found ; but no gardener would destroy the larvæ of the *Coccinellidæ*, if he knew that they, as well as the perfect insects, live chiefly on the *Aphides*. The *Ichneumon* flies lay their eggs in the soft skin of the cabbage and other caterpillars, by which means great numbers of these pests are annually destroyed. And were it not that many tribes of insects are destined to prey on others, the latter would become so numerous, that every green leaf and every species of green fruit would fall a prey to their ravages.

Of the many insects found in gardens, the *Aphides*, from their numbers, and from the great variety of plants on which they live, are, perhaps, the greatest enemy of the gardener, though no one is more easily extirpated, provided timely and proper measures be taken to kill or banish them. They are as troublesome in forcing-houses as in the open air ; in the former, they fix themselves on vines, peach, and nectarine trees, on strawberry plants that are forced, and almost all other plants taken in to be forwarded, whether for the flowers or fruit. In the open air, they destroy or very much tarnish our finest rose trees ; they attack peach, nectarine, plum, and cherry trees on walls, and, if suffered to remain unmolested, will destroy the trees entirely. When this happens, it is usually attributed to *blight*, the common name for all defects of fruit-trees, whatever may be the cause, whether from neglect, mismanagement, mildew, or insects:

The *Aphides* are produced by what some naturalists call *animalcular* generation ; that is, as they explain it, not only is a mother-insect impregnated by the male, but all her progeny also for nine or ten generations ; hence their astonishing fecundity and increase in a very short space of time. In the autumn they are oviparous, laying their eggs in patches firmly glued together round the bases of buds, or in any hollow of the bark. In this state they appear to be indestructible by frost, because, as soon as the warmth of spring commences, they come forth in myriads, leaving their little glutinous cases behind. In the summer they are viviparous ; and then the parturient females may be seen in the act of bringing forth their young in rapid succession ; so that if only a single female be seen on the point of a shoot, she is soon surrounded by a numerous family.

That the *Aphides* are easily killed by fumigations of tobacco-smoke is well known to every gardener ; or the trees sprinkled with snuff or tobacco-water from time to time, will keep them off. But the grand object of the gardener ought to be the prevention of the attack ; and this can only be done by applying a wash in the autumn, as soon as the

fruit is gathered, to prevent the mother-insects from choosing the plants so washed as a place for nidification, for, if this could be accomplished, there would be no early appearance of the young broods in spring. Soap-suds and tobacco-water we consider as good as any other wash invented to keep off the *aphides*, more especially if the ground under the trees be now and then dusted with soot, which is always offensive to insects seeking the sweets of either foliage, flowers, or fruit.

Such nauseous applications can only be used before the flowers or fruit appear, as the scent of the one, and the flavour of the other, would certainly be deteriorated by any portion of these ingredients remaining upon them. Fumigation may be employed to within a fortnight or three weeks before the fruit is ripe, as the taint of this on the trees is much sooner dispersed. Cherries on walls are often sadly disfigured by the *aphides*; their excrement, called *honey-dew*, falls on the fruit, and, being of a clammy consistence, every particle of dust sticks to the smooth skin of the fruit, rendering them unfit for the use of the table, unless they be thoroughly washed in water. Such trees should be well fumigated as soon as the fruit are as large as marrow peas; and should the *aphides* appear after this on the points of the shoots, they should be immediately trimmed off.

A fumigating cloth made of light canvass, and large enough to cover a wall-tree, an espalier, or a low standard, is a most useful appendage in a garden; indeed it is impossible to keep wall-trees free from these insects without fumigating bellows, cloth, and a powerful garden water-engine.

There are many different species of *aphides*, and of different colours, which, it would appear, is owing to the quality of their food. On the rose and many other plants they are green; hence the common name of *green fly*; on the elder and common garden bean they are black; on some geraniums they are red; and on crack-willow they are grey, and of a very large size, which is a very distinct species. A mealy sort attack cabbages and turnips in dry summers, and the common green species sometimes fall on the common field-pea in such numbers as positively to destroy completely the crop, leaving the surface of the ground white with their sloughs, and where there are also myriads of the little two and seven-spotted lady-birds devouring the *aphides* which remain on the ground after the podless straw is raked off. On one particular occasion, we could not but observe, at the same time, the vast concourse of summer-birds which congregated in the field to assist in the destruction of the *aphides*;—black-caps, garden-warblers, white-throats, lesser white-throats, three sorts of willow-wren, &c. &c., all attended by their young, had here a sweet and rich feast.

Greenhouse plants are subject to the visits of *aphides*, and, as this place cannot be fumigated without destroying its sweetness, the infected plants should be removed to a close frame, and fumigated there.

Ants are always found in company with the *aphides*; indeed, the appearance of the former gives the first intimation of the presence of the latter. The object of the ants is to collect the honey-dew, and they may be observed to push about the unwieldy bodies of their purveyors very roughly, in order to get at their excrements, or to compel them to void it. Whether the ants prey on the bodies, is questionable; for, though they may be often seen hurrying homeward with a young *aphis* in their jaws, it is said by naturalists that this capture is not for the purpose of killing and eating them, but for the purpose of placing them on some plant more contiguous to the ant-hill, to save labour. If this curious circumstance in the history of the ant be true, (and we cannot say it is not,) these little republicans may be proposed as examples of *sagacity*, as well as of *industry*, to man.

Ants are not very annoying to the gardener; it is true, they like a bit of ripe melon, peach, or pear; but this should be allowed for the great good they do in cleaning the trees of honey-dew, and for destroying a good many of the green larvæ of the *Tortrix*. They are, however, culpable in another affair which may just be mentioned:—there are very few hothouses but contain a colony or two of ants; and when fire is put thereto in spring, it awakens the ants from their winter doze; forth they come in quest of food, and, if they can find nothing else in the peach-house, they fall upon the anthers of the opening flowers, and make a prize of them for their young, or to place in the public granary at home. We have seen this depredation repeatedly, but believe it happens more from necessity than choice, as they never touch an anther if they can find their friends, the *aphides* in the house.

Some of the *aphides* are so nearly allied to several species of *coccus*, that they often receive each other's names. We cannot at present say exactly what the generic distinctions are, or whether they have been already defined. On this point we would beg the assistance of some one of our entomological readers, had they leisure so far to oblige us. It is a shame that, at this time of day, we hear one acute naturalist call the *American blight* the *Aphis lanigera*, and the next we meet, equally well versed in insects, declares it to be the *mealy coccus*.

(To be continued.)

MISCELLANEOUS INTELLIGENCE.

ON GARDENERS' SOCIETIES.—Sir, I have read with much pleasure the different letters in your two last numbers respecting the formation of a gardeners' society in the neighbourhood of London, convinced, as I have long been, that such an institution would have a powerful influence in promoting the improvement of horticulture, and in elevating the characters of its professors. Too long have we, by our mean envy, our petty jealousies, our contracted prejudices, and our gross partiality, allowed a stain to rest upon the character of a profession once at least distinguished for the intelligence and moral worth of its members; too long have we, in consequence, retarded the advancement of science, the cultivation of intellect, the diffusion of benevolence, and the progress of improvement in the practices of our art. True it is that there are many noble exceptions; true it is that there are men who, in spite of the sneers with which their labours have been met, and the dark insinuations which have been circulated by puny minds respecting their motives, have still continued their investigations, and, animated with a spirit of diffusive benevolence, have communicated the results to their thankless brethren. True it is that there are individuals who, keen in the pursuit of knowledge, and anxious for the spread of philanthropic principles, eagerly receive as a boon every fresh piece of valuable intelligence, and rejoice in contemplating every judicious system for the elevation of humanity, be the imparter of that knowledge, the author of that system, who or what he may. But is such conduct general? Are such principles in common operation? I point you not in answer to that still large class in whom the spirit of inquiry has never been aroused from its slumbers, who feel perfectly astonished how their brethren should pester their brains about such things as salts and gases, science and philosophy. Such men do but little harm, and that of a negative kind; but it is no negative injury inflicted upon the progress of improvement, when men, professing themselves to be anxious for the promotion of enlightenment, allow a principle of envy to gain such an ascendancy over their better feelings, that they scruple not to undervalue, nay, sneer at the labours of others; not because they can pick a fault with a sentiment which has been uttered, or a proposition which has been made, but merely because the authors of these labours belong not to a certain circle, within the bounds of which these sapient critics either believe all wisdom to reside, or would willingly confine every particle of information, and every display of intelligence. Hence, if a well-written, good-meaning essay

should appear in a gardening periodical, inquisitiveness is called immediately into exercise to ascertain the author. If it should be the work of a gardener in some celebrated establishment, it passes, with very little scrutiny, as sterling truth; if the effusion of some intelligent journeyman, the merits of the essay are tossed to the winds, while his presumption is spoken of in the most contemptuous terms; or if it should be the production of a gardener holding a small or formerly unheard-of situation, who, feeling his own deficiencies, advocates the formation of something like mutual instruction societies, vituperative exclamations are immediately put in requisition, while some of the swiftest footed of their would-be mightinesses scour the country, not more breathless with haste than with proclaiming (*aperto ore*) the infatuation of such an individual imagining for a moment that *they* would consent to impart to him the results of their experience, or humbly condescend to go to him for instruction or improvement.

I reluctantly advert to these things, not only for the purpose of exposing such a deteriorating principle, but also for the purpose of impressing upon the minds of those individuals who, like W. P. A., are anxious for the formation of societies upon a liberal extended principle, that they need not be disappointed, if many whom they have reckoned upon would never countenance their meetings. However extended my views respecting what such societies might finally become, I deem it to be of importance that a commencement should be made upon the simple principle of mutual instruction, as thus a society, or a branch, may be formed wherever a sufficient number of individuals can be collected. The only indispensable qualifications necessary for members of such unions are, first, that a man feels himself to be ignorant, and, secondly, that he feels that his acting upon the principles of true benevolence is absolutely essential to his happiness and enjoyment. Thus qualified, a man will freely communicate, without ostentation, what he knows; listen patiently to the sentiments of others, however homely the manner of expressing them; treat with gentleness, yet with honest plainness, those ideas which may appear to him untenable; submit his opinions to the test of scrutiny and the touchstone of investigation, never rejoicing more than when convinced of an error, knowing that from the arena of discussion, and the conflict of opinion, *truth* in all its brilliancy shall finally triumphantly emerge.

But what is to be done? Let every gardener impressed with the importance of such measures, lose no time in tendering his name as willing to become a member of a central society, or to endeavour to form a branch in his own neighbourhood. It is true that there are great difficulties in the way, but they are not so great as they have been; we

are improving, although slowly. Nearly four years ago this subject was adverted to in the *Gardener's Magazine*; more than three years since it was introduced into the *Register*, and not one remark was elicited upon the subject. No sooner has the matter been broached *now*, however, than it has immediately been supported by two intelligent correspondents, and, what is most cheering of all, one of them the secretary of a society already in existence. Still, however, it must be evident that, for the formation of a society worthy of gardening, and worthy of the age of improvement in which we live, private individuals can do but little. If gentlemen fond of horticultural pursuits would give such an institution their countenance, approbation, and support; if nurserymen would impress the importance of it upon their young men, and, although unable to take much part in its transactions, become at least its honorary office-bearers; if the editors of the gardening periodical press would give it their sanction and support, and become at least honorary or corresponding members; then, with such assistance, the institution would succeed; without such aid, it will never progress beyond mere agitation. The approbation of individuals like myself just goes for nothing. It is melancholy to review the many gentlemen's establishments and nurseries round London, where many men are employed, and yet not one vestige of an approach being made to a system of mutual instruction—no, not to the formation of a library, as at Clapton, which, to young men, must be of very great importance.

But can nothing be done now? Cannot you give your advice? Cannot your experience of the world enable you to determine whether such an institution is likely to succeed? One exists, and a flourishing one too, at Acton. I am glad its articles are not exclusive. Perhaps the want of young men, the monopoly to which W. P. A. refers, may be more owing to their apathy and indifference, than to any desire of the members. Could not this society be considered as a central one? Mr. Stapleton has promised every information. Would the Society, in the meantime, admit to its meetings all those from a distance who feel interested in such matters, as honorary members? I submit these hints to Mr. Stapleton's attention, and conclude this long letter with expressing my conviction that, when such institutions become generally prevalent, not only will a new era appear in gardening, but a new era in the moral and intellectual character of gardeners, by the expansion of mind to which they will give rise, and the subversion of the structure of narrow-minded selfishness, for raising on its ruins the beautiful edifice of uncompromising justice, based upon impartiality, and cemented with flowing benevolence and brotherly affection.—Yours, &c.

Hyde Park Corner, Jan. 15, 1836.

ROBERT FISH.

To the Editor.

SIR,—In conversation with an acquaintance of yours the other day, he apprised me of what I was not before aware of, namely, that you had, in your earlier days, made a voyage to China, in quest of certain plants, natives of that country, and had succeeded in introducing a few of them, which are now among the chief ornaments of our gardens. I asked whether you had ever published any account of the results of that voyage, but was answered, "Nothing further than some short papers in the Gardener's Magazine, and what was communicated to botanical friends seeking information about Chinese plants."

Being myself interested in obtaining the history of every known plant, and also a subscriber to the Horticultural Register now under your special management, I beg leave to suggest whether a series of papers describing your observations, made in the course of that voyage, might not be an amusing, and, I doubt not, an instructive narration to your readers. It would give you not only an opportunity of describing the herbs, shrubs, and trees you met with, but also the tropical scenery and effects of climate, of which untravellers can have but a very imperfect idea.

Trusting you will excuse this application from a stranger to your person, though not to your writings, and hoping that what I have taken the liberty to suggest will not operate as an irksome or disagreeable task, I remain, Sir, your obedient servant,

Exeter, Dec. 20, 1835.

G. B.

In compliance with our correspondent's wish, we have transcribed the following memorandums:—

REMINISCENCES OF A VOYAGE TO AND FROM CHINA, IN THE YEARS 1792-3-4.—The writings of Kempfer and Thunberg who had both visited the eastern parts of Asia, particularly China and Japan, gave glowing descriptions of the vegetable riches and beauties of that distant region of the world. These accounts created a strong desire among European botanists to procure living specimens of those foreign plants. The direct path to China was open, and trading ships from all the maritime nations of Europe, made frequent voyages to that extensive empire. Seeds could easily be purchased at Canton; but the buyers being totally ignorant of the Chinese names of the plants particularly wanted, the same worthless things were brought to Europe repeatedly, which been received a thousand times before. Very beautiful drawings of their flowering plants were often received in Europe on the manufactured goods of China; and the curiosity excited by the figures executed on screens, cabinet goods, &c., raised

a demand for drawings of flowers which could be purchased in every stationer's shop in Canton. Collections of these were received by the East India Company about 1780, and among them appeared the *tree pæony*, *nelumbium speciosa*, *double camellias*, *magnolias*, *azaleas*, &c. These drawings only served to redouble exertions to obtain living plants: as it was found even when really valuable seeds were procured in China, they perished ere they arrived in England.

His Majesty George III., Margaret, Duchess of Portland, lords Coventry and Tankerville, Sir Joseph Banks, and many others, encouragers of botany, and lovers of plants, were constantly using their influence with the officers in the East India Company's service to introduce both seeds and living plants from China. But no private individual took more interest, or exerted himself more strenuously in the matter, than the late Gilbert Slater, Esq., of Low Layton in Essex. This gentleman was extensively connected with the East India Company, being managing owner of several of their ships; and of course was in constant communication with the supercargoes at Canton, while he possessed the greatest influence with the commanders of his own ships.

Mr. Slater wrote and published a small tract of directions for collectors, with figures of the boxes, and manner of packing the plants for the voyage home. These he distributed among his officers and friends of the trade, and used every means in his power to accomplish an object, which as an amusement was a principal pursuit of his comparatively short life.

His country-seat at Low Layton (now we believe Mr. Barclay's) had extensive gardens, where every description of garden building for the preservation of exotic plants was erected, and where forcing was carried on in all its branches. The houses contained a fine collection of stove, greenhouse, and conservatory plants; the moor-earth borders were filled with the largest specimens of American plants that could be purchased: and floriculture was conducted on a most extensive scale. Every new imported plant soon found its way to Mr. Slater's collection, and it was moreover enriched by several Chinese and East Indian plants of his own introduction, as the *Hydrangea hortensis*, *Eriobotrya Japonica*, *Euphoria Litchi* and *Longana*, *Volkameria coccinea*, *Rosa semperflorens*, &c., &c. It may be here mentioned that Mr. Slater always divided whatever he had of value with Sir Joseph Banks for the Kew collection, as a safer means of preserving what might be received.

Every year large boxes of Chinese plants were received at Low Layton, not a tithe of which were found alive, and such as survived

the voyage, were only the same sorts as had been received frequently before, and therefore of no value.

Tired with these disappointments, Mr. Slater resolved to send out collectors in his own ships, whose care of the plants while homeward bound, was deemed the only chance of getting them alive to their destination. Accordingly he engaged a young man then (1789) employed in his garden, to take the trip. This young Scotchman whose name we have forgotton, embarked in the Carnatic Indiaman, Captain Corner, bound to Madras and China; but was unfortunately drowned on the outward bound passage in the Straits of Malacca. A successor was immediately inquired for; and we being then (1791) foreman of the houses and flower garden, accepted the appointment and joined the Triton, Captain Burnyeat at Gravesend, in the autumn of the same year.

To a young man naturally fond of botany, and which was then becoming a principal branch of the business to which we had been brought up, having an ardent desire of seeing foreign countries, and ambitious of the honour of being instrumental in the introduction of new plants, the offer was most fascinating, and more especially as the duty was to be performed under the protection of one of the kindest and most generous of masters, and in the company of several officers whom we had previously known.

We received instructions from Sir Joseph Banks written with his own hand, as to self-government in the ship, and when on shore; as to the choice and manner of keeping seeds, and treatment of plants on board the vessel. Similar and excellent advice I also received from the late W. Aiton, Esq. of Kew; and his son, the present W. T. Aiton, Esq. (who was present at our last interview), expressed himself envious of the station in which we were then placed. Every botanist, whether amateur or commercial, made a point of seeing and wishing us success; some of them escorting us to the hoy which carried us to the ship.

Our situation was in the Captain's steward's berth, the best, except one, in the ship; and having nothing to do in the business of working the vessel, (except what we chose to do when all hands were called,) we were treated and passed our time like a passenger.

The late worthy Mr. Conrad Loddiges begged of Mr. Slater to be allowed to send out four boxes of common hardy plants differently prepared and packed as an experiment, to ascertain which best bore the vicissitudes of the voyage to Madras. The first were apple, pear, plum, and rose trees packed in moss, in a close deal box which was not to be opened till our arrival in India, and while on the voyage to be

kept in the hold. The others, consisting of the same kinds with the addition of a few peach, gooseberry, and currant trees were potted in common soil, and placed in boxes, one of which was placed upon deck, and the others in the stern gallery. These were our outward bound charge ; and to which were added a large box of earth, planted with large roots of mangold wirtzel, as thick as they could stand together, for the purpose of yielding an occasional dish of greens for the captain's table ; and also two square tablets to be covered with thick flannel, on which we raised a handsome dish of small salad, for every Sunday throughout the voyage ; a stock of radish and mustard and cress seeds being shipped for the purpose before leaving England.

We also carried out three sacks of moss (*Sphagnum palustre*) to pack the plants in while at Canton. The number, size, form, and fittings of the boxes were to be made to our order in China, as by the time we got there we could observe what spaces could be best spared, and which would be completely out of the way of working the ship.

Our passage from Gravesend round to Torbay, was by no means pleasant to a landsman. Besides the ship's crew, the orlop deck was filled with a numerous detachment of East India Company's recruits, who had been recently enlisted in Ireland, nine-tenths of whom were the very scum of Dublin ; and a most unruly set they were. Soon after rounding the South Foreland, many of the men, both sailors and soldiers, were observed to be drunk. The fate of the Halsewell was then fresh in memory ; the officers immediately commenced a search for the contraband spirits, which caused a dreadful commotion in the ship. The officers however were victorious, every keg which was found in private hands was consigned to the deep, and all disorderlies were sent to their hammocks.

Proceeding down Channel, we encountered a heavy gale, in which the boltsprit was sprung, which caused us to bear away for Torbay, to refit. Here we lay for a week or ten days ; and it was not before the thirtieth of January that we took our departure from the Land's-End.

Here in a few words we may relate an instance of the mental weakness of sailors : the ship had just touched the ridge of a sand-bank, before coming to anchor in the Downs ; she also struck a sunken wreck off Beachy Head ; afterward, the boltsprit was sprung, so that by the time we cast anchor in Torbay the hardy tars considered all these mishaps as certain omens of a disastrous voyage. And so much did this idea prevail, especially among the old and able seamen, that half of them would have deserted the ship, if they had been allowed an opportunity.

We had a fine leading wind, which carried us quickly from the

British shore, and through the Bay of Biscay, with very little canvas, only the foresail and fore and main-topsails close reefed.

On the eighth day after leaving England, we had approached the latitude of Madeira, which island the captain had resolved to call at ; but on opening his sealed orders was peremptorily directed to proceed to the Cape of Good Hope without delay, with despatches for the Dutch Governor.

Before arriving at this latitude, the air was sensibly warmer. The gooseberry plants were first in motion, and in a few days after were in flower, but these quickly dropped off.

The north-east breeze, or rather gale of wind, which wafted us from England, carried us to the equator, which we crossed (with all the usual and ridiculous formalities) exactly that day month, from the Land's-End : an extraordinary quick passage. Here we were becalmed for a few days ; and here the heat was oppressive, usually from 85 to 90 degrees of Fahrenheit. All the exposed plants were in full leaf, and had made shoots two or three inches in length ; and though the roots were kept regularly watered, and the tops sprinkled every evening, the growth was feeble, the colour of the foliage pale, and in size diminutive.

A calm on the line, in the middle of the Atlantic Ocean, the clear blue sky thinly sprinkled with white tufty clouds, the blazing sun, the sea as smooth as glass, forming a mirror eighty miles in diameter, without an object on its surface to attract the eye, save, perhaps, the sudden lunge of the dolphin in pursuit of the flying fish, which rise in shoals before him, or occasionally the heavy form of the stupidly audacious and prowling shark by the ship's side ; all these circumstances, seen and felt for the first time, can scarcely be described in sober prose. They are most interesting to every mind previously acquainted with the theory of geography, meteorology, astronomy, and navigation : and, besides the daily occurrences among a jovial and healthy crew, of between three and four hundred persons, made our little floating world far from being either an irksome prison, or disagreeable abode.

The favouring south-east trade wind bore us south-westward towards the coast of Brazil, and doubling the small uninhabited, though beautifully verdant, island of San Trinidad, on the South American shore, gave a fresh departure for the Cape of Good Hope.

The plants during the whole time we were crossing the torrid zone, were constantly excited beyond their powers, and we need hardly explain to our readers the cause. So recently transplanted, they had not stamina to withstand the exhausting heat, nor could they enjoy

the refreshing coolness of night, as felt in temperate climes. Even the large tubers of mangold wirtzel were dried up, and thrown overboard; but small salad was grown expeditiously, and in great plenty.

Sailing south-eastward down the South Sea, every day presented new objects of admiration; and every night, new constellations. Among the former were troops of enormous whales, tumbling past the ship, and the wandering *albatrosses* (called by the sailors *Cape sheep*), skimming the ocean hundreds of miles from land. Of the new celestial objects, the *southern cross*, and the *three Magellan* or *imaginary clouds*, were most remarkable. The latter are always best seen in a clear sky; the two white ones are only large nebulae separated from, and of the same hue as, the milky-way; the other is an oval spot in the middle of the galaxy, quite free from stars, hence it appears like a black cloud.

By and by the cloud-capped table land of the Cape hove in sight, and shortly after we anchored in the harbour of Cape Town, among a considerable number of trading ships, chiefly French, but which were all off next morning. The secret of the despatches then came out, viz., we carried out the declaration of war against France, and which news was communicated to the commanders by the Dutch Governor.

The same morning we went on shore, and were immediately introduced to Mr. Francis Masson. This was a most interesting interview; we had all the botanical news of England to relate, and he had to tell of, and show us, his new acquisitions. This was indeed a treat, more especially in a stroll we took to view his collection in a small enclosed recess under the Table Mountain. There we saw, for the first time, the *Nymphæa cerulea*, which Mr. M. had just previously added to his collection; many species of *Stapelia* and *Heaths* which he had discovered and collected at the same time. He showed also a large assortment of seeds; for a small packet of which we offered a bag of dollars, but he was honourably proof against the temptation.

We dined together at a table d'hôte, where the Governor, and a great many officers, civil, naval, and military, were present. Eating, drinking, and smoking, had no charms for us then: we had another walk in the afternoon, and visited the public garden, a rectangular area of two or three acres, but much neglected. A few orange trees, and the myrtle hedges, were the only things worth looking at. Mr. Masson left the tavern late, and we rejoined the ship early the next morning.

(To be continued.)

ON THE PHENOMENON OF DEW.—That there are different opinions held relative to the formation of dew, appears from what has been written on the subject. The theory propounded by the late Dr. Wells

is very generally received, being adopted by some of the first meteorologists of the day, whose assent may be taken as proof that the Doctor's opinion is no longer hypothetical, but founded on demonstrable facts.

I presume not to question the correctness of the Wellian ideas, nor do I take up the pen to criticise or dispute the truth of any account of the phenomenon heretofore published ; all I intend to do in this paper is, to 'describe' the natural appearance of dew, as it is seen by every attentive observer, in every season, and under every circumstance of wind and weather, and which will serve to confirm all previous accounts which are true, or correct, perhaps such as are irrelevant.

From the earliest pages of recorded knowledge, we read not only of the morning and evening dew, but of the *falling* dew. Historians, and particularly poets, whether ancient or modern, in alluding to this beautiful meteor, always describe it as *falling*. To account for its precipitation and condensation, it was long held as probable, that exhalations from the earth during the day were raised, and sustained in the atmosphere by the heat of the sun while above the horizon ; but as soon as set, and his beams of heat and light withdrawn, the exhalations, becoming heavier as they are cooled by the night air, fall again to the earth, forming those pearl-like globules of the purest water attached to the point of every blade of grass and tender leaf, and to the salient angles on the margin of every leaf.

Dew is more or less abundant according as the air is clear and cloudless, and more or less calm. When wind prevails, no dew is formed on exposed plants, but on those only which grow in sheltered places ; neither is any formed, whether windy or calm, on grass-land parched by long-continued drought, though, at the same time, it is most copious on moist ground, and on the margins of lakes and rivers.

Dew-drops are not distributed indiscriminately, but on healthy vegetation only : dead or sickly plants carry no dew. If a healthy plant of grass, for instance, be growing in the midst of a thousand sickly ones, the first only will be dewed. This is often strikingly visible in gardens, and particularly in the business of forcing. In a vinery, the leaves of all the vigorous-growing trees are, on mornings, beautifully fringed with dew ; but on weak and stunted trees no drops appear. In hotbeds, when the young cucumber or melon plants are progressing prosperously, they are seen to be finely embellished with dew-drops when uncovered on mornings. In both these cases the dew is formed under every degree of temperature between thirty-five and ninety degrees of Fahrenheit's scale.

In the open air, when the sky is cloudy, and a strong breeze of wind prevails, no dew is formed on any exposed plant or place ; but if any

part of a moist meadow happen to be covered by a garden-hand or bell-glass, or by any impervious covering, transparent or opaque, a copious dew will be found beneath, while the herbage around is quite dry.

If two pieces of arable or garden ground be sown at the same time, and with the same kind of seed, but having been differently prepared for the crops—one of the pieces by trenching, say eighteen inches deep, and the other by common digging only—the seedlings will rise on both at first equally strong; but the plants on the trenched part will not only outgrow those on the digged ground, but will always be seen to carry much more dew, though both are exposed to the same atmospheric influences. The same effect may be seen on waste or on uncultivated lands, where a stratum or bed of rock lies near or just within the surface. Over the bed of rock dew is always less plentiful than it is where there is no rock, or where it lies at a greater depth.

Dew-drops are iridescent when seen between the sun and the eye; and when a person's shadow is, on mornings, thrown on a bedewed surface of grass or young corn, a halo or glory appears to surround the head of the observer's shadow.

Dew is formed during clear frosty nights as plentifully as it is in warm weather, only, in such a chilled state of the air, each floating vesicle of water is frozen either before or immediately after it is united to the previously-formed globules on the green herbage.

It has been already observed, that dew-drops are attached to the points and acute angles of the leaves of all healthy plants near the surface of the ground. The presence of dew upon a plant is the strongest indication of its perfect health and luxuriance. What, it may be asked is the cause of this? Is it because the acute angles, being more prominent, catch the floating vesicles more readily? We may easily conceive that, when a larger globule of dew is once formed, it will readily attract the smaller globules or vesicles floating near it, and so become larger and larger, till it falls by its own weight. But may not these attractions and condensations of the vapour be caused by some *inductive* power of the vegetable organisation? Electric or gaseous currents of some kind may be absorbable by the plant, and the points, as they always contain the end of a vascular branch of the structure, may exhibit some inhaling agency which may carry the vesicles of vapour to the inlet.

I am the more inclined to suggest these questions, because, although dew-drops are most commonly seen on the acute angles of leaves, they are not always so disposed. The leaves of the common nasturtium, or Indian cress (*Tropæolum majus*) are what botanists call *pettate*, that is, the foot-stalk is fixed, not in the edge, but to the centre, whence

atmospheric veins diverge outwards to the margin. At the point of each vein there is a slight indentation in the margin, and in this the dew-drop is suspended, showing that it is attracted by some action of the vein of the leaf, rather than by the more prominent parts of the margin.

Dew begins to be formed as soon as the solar beams are withdrawn, and is increased till sun-rise, when it is gradually exhaled away. That the dew-drops are condensed vapour, is self-evident; but whether this vapour descends from the atmosphere, or is evaporated from the earth by the radiation of the sun's heat, united with that subterranean heat which is ever escaping from the surface, (together producing, by the escape of heat, that extreme cold on the surface,) is not so evident, though, perhaps, the preceding observations, if faithful, may assist those, who contemplate the phenomenon, to arrive at a pretty sound conclusion. The evaporation from the earth is often beautifully visible on damp ground on serene evenings in summer and autumn, lying like a thin cloud on the steaming surface after a hot day, and, doubtless, is ever rising whether visible or not.

But there are other condensations of atmospheric moisture which should be considered in connection with the foregoing observations on dew, as they are phenomena perfectly distinct from each other. Water is soluble in air, and unites with it so intimately, that its transparency is not in the least diminished, or it is buoyant in the atmosphere, in a vesicular state, and takes the appearance of mist or clouds. A change of the temperature of the air produces a change of the condition of the water floating in it; that which is in a state of perfect solution becomes vesicular, and that which is in the form of clouds is condensed into larger drops, and descends as rain. So all solid bodies on the earth being often colder than the air, attract from the latter both its heat and aqueous particles, condensing the water into large drops on the surface, which coalescing run in little streams to the ground. During a season of frosty weather, all solid bodies, as stone, marble, or metals, are cooled down according to the intensity of the frost, and, on a return of warmer weather, these solid bodies will be continually covered with moisture till their temperature becomes equal to that of the air. This circumstance is frequently witnessed in summer, as well as in winter. All solids, as the stones and pavement in the streets or around buildings, become cool during nights; and such as lie out of the morning rays of the sun, will continue to attract moisture till nine or ten o'clock, or till their temperature is equal to that of the air.

All these instances of the condensation of vapour are the effects of that general law of nature, by which all fluids tend to an equilibrium,

the colder body constantly receiving the particles of heat which float (surrounded by a vesicle of water) in the surrounding medium. Such condensations, however, cannot with propriety be called dew, though it is very common to say, "the marble is dewed." A decanter of cold wine or water brought to table in warm weather, is said to be "soon dewed;" but the processes are dissimilar. In the last-mentioned instances of condensation, there is great disparity in the temperatures of the dewed body and the medium whence the moisture is drawn; whereas, in respect of those slender, unsubstantial leaves of grass which carry most dew, it cannot be supposed that their lower temperature is the attractive quality, because, if the experiments made by naturalists with delicate thermometers be true, the interior of free-growing plants is always of higher temperature than the air around them; and in the case of the hotbed dews there both the vapour and the plants are equal as to temperature. It is true that the lowest stratum of the air in contact with the surface of the ground, is necessarily colder (in consequence of radiation and evaporation) than the superstrata; yet it does not follow that the leaves of healthy vegetation immersed in it are still colder, to attract and condense water as a block of marble does.

Whatever may be the cause of the formation of dew, and whatever the source whence its globules are collected, I need not endeavour to explain by mere conjecture; the foregoing description of the phenomenon, under the various circumstances in which it appears and disappears, will serve to assist the inquirer who has pleasure in the study of meteorology.

J. W.

OBSERVATIONS ON THE ROOFING OF HOT-HOUSES.—The earliest, and by far the most common, forms of glass roofs for hot-houses, are lean-tos against a wall more or less elevated in front. Such roofs are generally laid at about an angle of 45 degrees from the horizon; this pitch being considered most receptive of the rays of light, and equally safe from leakage of rain, or from the direct pelting of hail-storms. Narrow houses for forcing peaches, are usually covered with single lights, the whole length of the rafter: wider houses, as graperies, have two tier of lights, the upper tier sliding down over the other, with low glazed fronts and ends.

This form is the most simple, and, as already said, the most common. Many opinions are held as to the proper angle in which sloping roofs should be laid; and some persons have been at the pains to calculate the angles of incidence of the sun's rays, from his rising to his setting, for every day in the year upon a plane surface; and all this to ascertain which inclined angle would intercept the greatest number of the rays. We know not that any great good has resulted from the conclu-

sions come to by the calculators. But we know well that it was long ago suggested, that all forcing houses should have a roof facing three ways, viz., one graduated towards the east, to receive the morning sun, one towards the south, to intercept the mid-day, and another sloping to the west, to catch the setting beams. A modification of this scheme has been acted on; and some beautiful conservatories were so built fifty years ago. These buildings had glazed upright ends in the common way, and next to the ends had five or six rafters and double lights laid also in the common way; but from these points the back wall began to rise, and the front was carried outwards circularly; so that the middle of the building was swelled outwards and upwards, much more than the two ends. The exterior of these buildings was handsome, and the interior was convenient, in so far as that plants of all heights had ample space; and the sides of the swell certainly admitted more both of the morning and afternoon sun into the house. But the construction had defects: the lights which sloped laterally allowed every heavy shower to be thrown diagonally to the lower side, which either found its way through under the side of the sash, or was precipitated with force over the front gutter. Another thing, the centre lights were so large and heavy, that, though counterpoised by cast-iron weights behind, they were always a great plague to be let down, or be got up.

This plan was only an approach to the curvilinear roofs, which soon afterward came into fashion, and as erected at Messrs. Loddiges', and many other places. Light, that grand and indispensable agent in the development and maturation of vegetable productions, was deemed everything for plants shut up in buildings; and hence the rejection of clumsy wooden rafters and sash-bars, and the substitution of those of cast-iron. Here perhaps the lover of new symmetrical forms, and the iron-founder together, got the better of the plain common sense of the gardener (ourselves among the rest), who knew well that without light no plant can thrive; but also knew that there may be *excess* of light, and particularly between the hours of eleven and three in the afternoon, of cloudless days; so that any part of the structure, which mitigates the sun's ardour during these hours, is an advantage rather than otherwise. Still it must be confessed, that a good thing may be refused, but which cannot be commanded; a single mat, or an awning of thin canvas, may qualify the sun's light and heat (for we cannot well have the first without the second also), but by no means can we gain an intenser degree of light than the face of the sky happens to give us. And if therefore a house be constructed to admit at all times the greatest volume of light, *it is well*, provided there is at the same time

convenient means for shading when necessary. What would the pine-grower do without the means of shading? His plants would become stunted, contracted in volume, and yield smaller, though probably higher flavoured fruit. Hence a high and well lighted pinery is not so well adapted for the growth of pines, as a low and somewhat gloomy pit. In the native country of the pine-apple, as well as all other tropical plants, they cannot have more than twelve hours' light, in the longest day of their summer, whereas, in this country, during the principal period of their fruiting, they enjoy from fourteen to seventeen hours' sunlight, besides long twilights, which they do not have at home. And this may be one reason why pines, as well as other exotic plants require shading, in the middle of our summer days. It may be answered that, if tropical plants have more sun in our summer, they have less in our winter, and therefore there is something like equalisation during the year. True: but as light is only one of the general influences received from the presence of the sun, and as we can supply the other by art, it does not appear that pines particularly suffer from want of sunlight during our short days.

The object of the hot-house builder should therefore be to gain the morning light until eleven forenoon, and retain it as long as possible after three in the afternoon. And in the interval between these hours more shade should be thrown upon the plants, than there is before eleven and after three. This can only be done by opposing the opaque parts of the roof to the noon-tide sun, and placing the transparent parts so that the sun's rays shall not pass through at right angles.

That this has been accomplished by Mr. Paxton at Chatsworth, as well in a greenhouse lately built, as in the design for the conservatory intended to be built, we can affirm from a plan and elevation of the first, and from a model of the second, both of which we have seen and examined. Of this entirely new plan of roofing, we are in hopes of being able shortly to give figures in the Register, to be supplied by Mr. Paxton himself, but in the mean time we shall close this paper by some slight description.

In order to give a faint idea of the construction of the roof, let us suppose that a hot-house is to be built in the common way, against a north wall of a garden, but to be covered with a Paxton roof (as we shall take the liberty to call it). Two sets of rafters, or principal bearers, are required; every other one being supported, say three feet higher than the intermediate ones. Of course there is, or may be, two plates, one three feet above the other in the back wall, into which the rafters are, or may be, dove-tailed for the better security of the building. The upper and under bearers are united by smaller ones, to bear the

glazed lights or sashes, which are fixed ; and these falling east and west from the higher to the lower rafters or principals. Thus the whole length of roof will be formed into ridges and valleys ; and the front eaves will present a series of little glazed gables. This form of roof renders gutters necessary in every valley, and pipes at the bottom of each, to carry off the rain, and melted snow water from the roof.

By this disposition of the glass lights, it is obvious that the greater part of every ray of light from the eastward will be admitted, and also the same from the west. And, moreover, the heat of the meridian sun will be so far qualified by the shadows of the bearers, the short rafters, and frames of the lights, together with the refracted transmission of the rays through the obliquely lying glass, that no extreme degree of heat need be feared in the middle of the day, nor yet will there be any prejudicial want of light at any time.

We know not how such a house is ventilated, but, besides the facilities afforded by the upright front and ends, many simple contrivances may be thought of to allow the escape of over-heated air.

In the further consideration of this new method of roofing hot-houses, we have, in the first place, to notice how far it may, or may not, be suited to the changes of weather experienced in this climate. On a first view, its liability to collect and retain an inconvenient load of snow, seems to be the most material objection ; because, although a coat of snow is soon melted off a forcing house, yet, as it would keep slipping down into the gutters, attention will be required to keep them free.

In the second place, how will such an irregular roof suit the plants cultivated under it ? The irregularity of a roof can make no difference to plants not trained to it, such as pines and collections of stove or greenhouse plants ; but for a vinery it does not at all appear to be convenient, because though a wire-trellis could be made parallel to the surface of glass, still, from its wavy position, it would be, we think, at least inconvenient to the vine-dresser. The same objection may be made to training peach-trees on such a roof ; but we are not aware of any other defect or inconvenience to which the plan is liable.

It may be thought, perhaps, that all the advantages alluded to might be gained by placing the forcing-house north and south, instead of east and west, and covering it with a common roof, falling both ways, and to build at the north end a high sheltering wall. This would receive all the benefit of fore and afternoon light ; and would also be as shady in the middle of the day, as the other more complicated roof. But, as we are yet imperfectly acquainted with all the merits of the Paxton roof, we shall add nothing further concerning it, till we re-examine the promised drawings.

(To be continued.)

NOTICES OF PLANTS FIGURED AND DESCRIBED IN THE FOLLOWING
BOTANICAL PERIODICALS, VIZ.

EDWARDS' BOTANICAL REGISTER, continued by Dr. Lindley
The January number contains—

1. *Cosmelia rubra*. Red Cosmelia. A handsome greenhouse plant, with the habit of an *Epacris*, and belonging to the natural order *Epacrideæ*. The flowers are terminal at the points of the twigs, and mostly hanging downwards; their colour is reddish purple; their form a bellying tube, three-quarters of an inch in length. It is said to be partial to marshy places on the south coast of New Holland. It belongs to the fifth class and first order of Linnæus.

2. *Lasthenia Californica*. Downy Lasthenia. A small syngenesious annual, flowering about six weeks, at different periods of the year, according to the season at which the seeds are sown. It is a plant of very little beauty.

3. *Aristolochia fæten*. Stinking Birthwort. A West Indian plant, which flowered lately in the stove of Mrs. Marryat, at Wimbledon. Like all other Birthworts, the flowers are grotesque in shape, and, like some of them, diffuse a most abominable scent. The flowers are large, and so marbled with purple and dirty yellow, that they are a puzzling and tedious task for an artist to represent properly. This genus, placed in *Gynandria Hexandria* by Linnæus, gives a title to one of the natural orders of Jussieu, viz. *Aristolochaceæ*.

4. *Pleurothallis picta*. Painted Pleurothallis. A small orchideous plant from Demerara, somewhat similar, but different from, *P. Grobyi*. This species, though in all its parts diminutive, is, like many other small plants, very curious and beautiful when closely examined. "Its tufts of foliage are rapidly formed, under good management; but it seems to require the close atmosphere of a bell-glass."

5. *Hibiscus Rosa Sinensis*. Single-flowered Chinese Rose-mallow. The double varieties of this plant have been long in our collections; but the single one is comparatively rare, and much more beautiful than the double sorts. It is common all over India as well as China.

6. *Pimelea ligustrina*. Privet-leaved Pimelea. This is a hardy greenhouse plant, readily multiplied by cuttings, but requires much fresh air in winter, otherwise it is liable to damp off.

7. *Dendrobium densiflorum*. Dense-flowered Dendrobium. "This lovely orchidea," says Dr. Wallich, in his splendid *Plantæ Asiaticæ*, "comes so near to Roxburgh's *Dendrobium clavatum*, that I should consider them as identical, if he had not ascribed bulbs to his plant, of

which ours is entirely destitute. In the Calcutta garden, the two plants maintain that character, although in other respects they are alike. It is possible that, under particular circumstances, the bulbs, or pseudo-bulbs, may become elongated into clavate stems; and, if so, the Silhet plant would be the same species with ours from Nipaul."

Beautiful as our specimen is, "it is still inferior to what is produced in India; so that cultivators have still a point to gain in respect to this charming species."

Dr. Lindley adds accounts of other species found near Sidney Cove, in New Holland.

SWEET'S BRITISH FLOWER-GARDEN, continued by D. Don, Esq. The number for January contains—

1. *Agrostemma Bungeana*. Dr. Bunge's Scarlet Campion. A hardy perennial, requiring a loamy soil, and is increased by seeds, which it ripens freely. The drawing was made by Mr. James Macnab, from a plant which was received from Messrs. Booths' Flotbeck Nurseries, near Hamburg, by Dr. Neil, of Edinburgh. Mr. Don thinks it is a native of Asiatic Russia.

2. *Verbena rugosa*. A didynamous perennial, belonging to the natural order to which the genus gives a title. It is a very showy border plant; was raised from seeds received from Buenos Ayres by Mr. Cameron, curator of the Birmingham Botanic Garden. It is allied to *V. venosa*, but is perfectly distinct by its stalked leaves being cordate at the base, and having hairy corollas, &c.

3. *Nierembergia calycina*. Large-calyxed Nierembergia. Linnæan class and order, *Pentandria Monogynia*; natural order, *Solanææ*.

"This remarkable species, which combines entirely the habit of the group *Petunia* with the corolla of the normal *Nierembergia*, was gathered by Mr. Tweedie on the banks of the river Uruguay, in the republic of Buenos Ayres; and from seeds transmitted by him the plant was raised in the Botanic Garden at Glasgow, in 1834.

4. *Daphne odora*: var. *rubra*. Red-flowered fragrant Daphne. An erect, evergreen, bushy shrub, about two feet high, imported from China about four years ago, and flowered in the collection of Mr. George Smith, nurseryman at Islington, in the latter end of November. It appears to be pretty hardy, and is a valuable acquisition, being finely scented. The flowers are purple, and appear in heads at the points of the branches.

PAXTON'S MAGAZINE OF BOTANY, for January, contains—

1. *Ixora Bandhuca*, one of the most beautiful species of this most

beautiful genus of plants. It is a native of India, and flowers frequently in the stove.

2. *Calceolaria Hopeana*. Mr. Hope's new Slipperwort. This is one of the most showy of the genus, the flowers being very large and numerous. The colour is yellow, without much variegation; but the gracefulness of the truss, and the amplitude of the flowers, compensate for want of deep colours.

3. *Manettia cordifolia*. Heart-shaped-leaved Manettia. A beautiful climber, and well worth a place in every stove collection. It belongs to the natural order *Rubiaceæ*.

4. *Maxillaria Deppei*. Mr. Deppe's Maxillaria. A fine-flowering orchideous plant, lately introduced, and has flowered in several collections.

This number also contains the history and culture of the Sugar-Cane.

SMITH'S FLORISTS' MAGAZINE, for January, contains—

The Elizabeth and Homer Tulips; Young's Earl Grey and Lancaster Lass Carnations; *Phlox Drummondii*; Perfection *Pelargonium*; and the *Rhodochiton volubile*. They are all beautifully drawn and coloured, and, as usual, accompanied with very valuable remarks as to their history and culture.

To the Editor of the Horticultural Register.

QUESTIONS AND ANSWER.

SIR,—I ought to apologise for troubling you with my letter and queries; but as I dare say that you have other subscribers who are as ignorant as myself, and as your good-nature must be in frequent requisition, I venture to apply to you, trusting that you will, either by letter, or through your Register, give me the information that I ask.

The garden which I have just come into possession of contains about fifty yards of glass, divided into three houses. The vines have been planted above thirty years; during the last twenty they have had no other attention than common pruning. What we wish to know is, whether an addition of compost will be sufficient, without having entirely new plants. And if you would give me a few hints how a piece of ground, (fifty-four yards by twenty-four,) surrounded by a wall, can be made a pretty pleasure-garden of, I shall be more than obliged to you.

Perhaps you would also make known to me how I may propagate the white Banksia Rose, as I do not find the usual cuttings to succeed with that variety.

ANSWER.

WE have pleasure in answering our correspondent by observing, that in respect to the vines, if they are still healthy, they only require proper pruning, to be made as fruitful as ever. Their age is no detriment, provided the knife be judiciously used. Much, however, depends on the condition of the border; it should be dry, of an open porous character, and be moderately rich. If poor from neglect or cropping the surface, it may be easily made rich enough by merely breaking up the surface with a fork, (not a spade,) and covering it with two or three inches thick of rotted dung, the juice of which will be washed down by the rain.

Respecting the little walled garden, we can only say that, if fruit-trees be on the walls, they probably must be cared for by not choking them with shrubs, although flower-borders may do no harm. If there be no fruit-trees, then as much variety as possible should be given to the spot, by giving it a general carpet of turf, carrying a sand or gravel-walk wavingly round the outside, hiding the walls and walk from the windows, if any look into it, and filling the centre with irregular-shaped clumps of shrubs, and beds and knots of flowers, to give variety and interest to the whole.

The rose mentioned is best propagated by layers.—Ed.

CALENDARIAL MEMORANDA FOR FEBRUARY.

KITCHEN GARDEN.

OUR memoranda for last month are still available, as it is more than probable that but little of what was then advised to be done has been in the interim executed. This necessarily leaves more to be done in the present month, and, therefore, every mild and sunny hour must be taken advantage of. At this time we have only to renominate the different things mentioned last month, with the additional advice, that, if no sowing has been done during January, double quantities must be put in now. This applies chiefly to peas and common beans; and, besides the sowings of the latter in the open ground, a quart or two may be sown on a little heat under glass, or in boxes to be placed in heat for transplanting about the beginning of April.

Transplant cabbage and lettuce, if not already done, as soon as possible; and even if done in the past month some more of each should be put out at the end of this.

The first planting of early potatoes may be put in upon a dry south border

towards the end of the month. Place the sets, whether whole or in pieces, five inches deep, and in rows thirty inches apart. The tops of this planting may perhaps be killed by night frosts in April or May : but, nevertheless, they will yield tubers at an acceptable time.

Many different things must be sown in this month, as cabbage of sorts, savoys, cauliflower on a moderate hot-bed ; celery under a hand-glass on a south border, or in a box placed in a frame or hot-house ; carrot for an early crop ; parsley and Hamburg parsley, a single drill of red beet ; spinach to succeed that sown in Autumn ; a bed of leeks towards the end of the month for transplanting ; parsnep, various sorts of lettuce, radish, and small salad herbs twice.

All kinds of crops in rows or drills will require hoeing among, and some of them may require earthing up. The action of the hoe assists to dry the surface, and renews the cultivated face thereof, as well as assists the growth of the plants.

It is not yet too late to do many things advised to be done in the three preceding months ; such as transplanting fruit trees, making new plantations of horse radish, or liquorice, where required ; carrying on manure or prepared composts ; trenching, &c., &c.

The business of the melon ground and forcing houses now engrosses the principal part of the time, and much of the care, of the gardener. One excellent rule in the management is, never to defer doing what is necessary till the necessity is actually visible. The business of gardening is based on *forethought* ; and he who cannot foresee what is likely to happen a week or two before the instant day, is by no means well calculated for the duties of forcing. We have lost, or seriously injured, many hotbed crops by merely delaying to apply till Saturday a lining which should have been put up on the Thursday before. Experience teaches what is necessary for every plant artificially treated, and practice enables a man to judge from ordinary feelings whether circumstances are favourable, especially as to the necessary temperature ; still a thermometer may be consulted with advantage even by the most experienced hand.

The stove, green-house, and flower-garden, require the usual superintendence. The latter may still undergo any necessary alterations and improvements, as to reducing or enlarging beds, or clumps ; dividing the overgrown stools of perennials and planting new sorts ; the beds of bulbs and tubers being carefully defended against hail-storms and severe frost. About the end of the month dahlia seeds may be sown, and raised on a little heat, and so may all other annual or other plants which are wished to flower early. Seeds of both greenhouse and hot-house plants are also best raised about this time in order to meet the summer. Another set of flowering shrubs may be brought into heat to succeed such as are fading.

RODGERS' GOLDEN CRIMSON CARNATION.

Was raised in Kent, a few years ago, from seed procured from Brussels; it remained a year longer than usual before it flowered; for some time Mr. Rodgers had considerable difficulty in raising a succession, and, when he removed to Derbyshire, one pair was all he had. From these another pair was raised, which I purchased.

Some time since, in writing of this carnation, I stated that it did not readily strike from layers; but I now find if layered in sand and leaf-mould it strikes root well; indeed it will bloom better if grown in this soil than any other.

Mr. Rodgers has now a few pairs to dispose of, at one guinea per pair. In conclusion, I beg to state, that the plate is an exact copy of the flower, no petals were taken out, in order to make it more perfect.

GEORGE T. DALE.

Wirksworth, Derby, 14th Jan., 1836.

REMARKS ON THE WEATHER

NEVER do we remember to have seen so frequent and extreme changes of weather as have taken place since the date of our last remarks. Within the space of twenty-four hours, the thermometer has ranged from 14 degrees of frost to 12 degrees above the freezing point, that is from 18 to 24 degrees of Fahrenheit's scale. This variableness has not only been felt in one locality, but, as appears from the newspapers, all over the kingdom. At this moment, some of the western counties are covered with snow, while in the south we have neither frost nor snow; on the contrary, some days are as mild and genial for vegetation as an April day. And in Spain and in the south of France, frost has been severe, and ice plentiful.

These extreme changes in this country have redoubled the labour of the gardener, in defending his tender things on nights, and exposing them on mild days: for as much damage may be sustained from unnecessary coverings, as from complete exposure. These mild and open intervals have allowed opportunities for getting in the peas, beans, and other seeds required to be put in, during the first month of the year—transplanting of trees, shrubs, and culinary plants, and all manner of ground-work have been advanced, and though the business of the kitchen-garden is not so forward as it was last year, it is nevertheless as forward as it is in ordinary seasons.

The *Eranthus hyemale*, and *Helleborus niger*, are both now in full bloom; and most of the bulbs are pushing vigorously.

January 24th, 1836.

PAXTON'S
HORTICULTURAL REGISTER,
MARCH, 1836.

HORTICULTURE.

ON THE SHANKING OF GRAPES.

Wirksworth, Derby, January 14th, 1836.

I HAVE read with great pleasure and interest, the numerous paragraphs which have of late been written on this disease. An excellent paper appeared in your November number, also in your last ; but these throw but little light on the subject after all ; indeed, I think till lately sufficient attention has not been directed to it.

Very numerous are the opinions as to its origin ; the favourite opinion seems to be that it proceeds in a great measure from weakness. Here I would observe that the shrivelling, or I should rather say the withering of grapes produced from weakness, is in my opinion a very different disease from shanking. Mr. Judd has made some excellent remarks on this subject. The shanking takes place almost as quickly as a tree withers when struck by lightning. A person who has closely watched this disease, will have observed, that he may go into his house and see his grapes all looking well, and he shall return in three hours and find the fruit struck with this vexing disease. Now did it proceed from weakness, the shrivelling would be more gradual. My opinion on this subject is very similar to Mr. Judd's, indeed I am inclined to think that nothing but damp and noisome vapour could produce the effect ; and here I would observe that most gardeners are afraid of giving their vines too much air. I am convinced in most cases they might give them much more, and with great advantage. If I may be allowed to use the expression, I should say the shanking in grapes was a very similar thing to a paralytic stroke on the human body ; its effects

are nearly the same. Mr. Ayres asks, if the disease proceeds from an over-moist and over-heated atmosphere, would not the syringing and shutting up of vineries in the afternoon, produce the same effect as the over-heated condensed moisture of the morning? To this I would reply—no question about it, if the house was the least inclined to be damp. The great error which has kept back further discoveries with regard to this disease, is, I am inclined to think, the confounding of the two together.

As my paper is exhausted, I will in a future number, if you think this worthy of admission, say more on the subject.

G. T. DALE.

ON THE WHITE TOKAY GRAPE.

SIR.—In the last number of your Register, I observe a paper upon the management of the White Tokay, or Muscat of Alexandria grape, with a view to the well setting of its blossoms. My motive for writing this little notice, is to correct the mistake of confounding these two grapes, and supposing them to be the same: an error, which, as it tends to increase the already too much confused list of grapes, calls for immediate correction.

The White Tokay, really the genuine Tokay (there being but one *white* variety) is a very choice grape, of a vinous flavour; bunch small, very compact with no shoulders: this latter is at once a distinguishing feature from the Muscat, which in the extent of its shoulders, frequently renders the bunch as broad as long. The wood of the Tokay is very white, that of the Muscat is of a rich red brown; the leaf of the former is stiff and very downy, in the latter it is large and pendulous.

At the garden of a nobleman, where I lately lived, (who is well known for his excellent taste in the grape,) both varieties grew side by side in the same stove; and from recollection I have given this description.

Those of your readers who possess Lindley's Guide to the Orchard and Kitchen Garden, will find the Tokay grape accurately described.

I hope A. B.'s mode of treating the Muscat will be tried by those who have the convenience: few grapes set so indifferently; which clearly points out the necessity of some peculiar treatment: the same with the Black Damascus; Stilward's Sweetwater; both which I have seen fail in a fire heat of 70 degrees. The foliage of each seems invariably to suffer in a high temperature.

A. YOUNG GARDENER.

ON THE DIFFERENT METHODS OF TRAINING FRUIT TREES ROUND
THE QUARTERS OR COMPARTMENTS OF KITCHEN-GARDENS.

PLANTING single fruit trees irregularly over the surface of a kitchen-garden, is an old but exploded custom. They proved injurious to the under crops, and, subjected to no order of training, always gave the garden a wild look instead of one of neatness and regularity. On the other hand a kitchen-garden entirely destitute of trees, has a bald unfinished appearance which is equally displeasing.

To have fruit trees symmetrically trained, and which do not usurp too much space, is what would occur to every one as most desirable, and accordingly the old French and Dutch fashion of espaliers was very early adopted in this country. And so indispensable were espaliers considered formerly, that the most expensive rails, as they are called, were in many places erected for the trees. We have worked in a garden where the espalier rails were made by carpenters of the best yellow deal, with top and bottom rails, into both of which the uprights were all morticed, painted light blue, and fixed in stone pattens. Moreover, at each corner there were lock-up gates, of no manner of use, but of much trouble to the foreman, who had to see all these gates were locked every evening. And, what was worst of all, the construction was bad; the uprights being so large, that it was impossible to keep the trees in proper form, unless nails and shreds had been used.

Many different forms of espalier rails have been invented, and of either wood or iron: but none answer the purpose better than rough six-foot stakes, pointed and charred at bottom, driven by line fourteen inches into the ground, and connected at top by a ledge of some kind of tough wood. The stakes are about ten inches from each other, and along them the lateral branches are trained.

The most common form of training on espalier rails, is that called horizontal, that is, with an upright stem, and the branches led right and left in pairs therefrom. This is the most symmetrical and suitable for the purpose; very little ground is occupied, and espaliers so trained are profitable and neat boundaries to the quarters of a garden. They are easy of access, either for pruning, training, or gathering the fruit; and the trees are perfectly safe from being damaged by wind.

To form a tree intended to be trained in this manner, maiden plants one or two years from the graft are chosen; and, the ground being well prepared for their reception by trenching, &c., are planted opposite a

stake, to which the most central shoot is always trained. Two lateral shoots are tied down horizontally, about eight or ten inches from the ground, annually continued outwards from the stem as far as they will go, or until they have reached to the outside of the space the tree is intended to cover. Thus the young tree consists of only three shoots during the first year. At the end of the first year the central leader is pruned down to about a foot long, and this on the following summer will, or may be allowed to, produce three shoots, the topmost to be trained upright, and the others, one on each side horizontally. This method of pruning down the upright, and leading the laterals horizontally, is continued year after year, until the central shoot reaches the top, when, if the two last laterals are high enough, it is entirely pruned off.

When a young tree is very vigorous, the desired form may be more expeditiously obtained, by making the upright produce two pairs of laterals, instead of one pair. This is done by stopping the upright when it has attained the length of twelve or thirteen inches. This will happen, perhaps, about the beginning of July; and will cause three other shoots to be produced during the Autumn, to be trained as before. We have seen a young Jargonelle pear tree managed so as to produce three pairs of laterals in the course of one summer; but this is not a common case.

Some practitioners prefer having two stems rather than one, because it diverts the upright current of the sap into two channels, and thereby induces a slower growth, which is favourable to early fruitfulness. In this plan, a young tree having four shoots is planted between two stakes. These receive the two middle shoots to form the uprights, and the two outside shoots are tied down horizontally. The uprights are annually pruned down to furnish laterals year after year till the form is complete.

Whether with one or two stems this style of training always looks neat; and, when the trees are also fruitful, is preferable to any other, whether on a low wall or espalier. But it requires considerable skill and almost hourly attendance during the summer, to accomplish this desirable result. The natural tendency of the tree is to rise upward; and instead of the buds which come forth from the stem and branches being formed into flowers, they are chiefly produced into barren shoots. A strong growth of these are annually produced, and for the most part at right angles to the branches; and therefore, departing so entirely from the style of training, must necessarily be pruned off to maintain the symmetry of the tree. If this luxuriant summer growth be allowed, it at the same time strengthens and extends the roots by prompting

them to increased action in the following year ; a circumstance rather to be avoided than encouraged in a fruit tree.

To obtain the desired form and induce fruitfulness, the vigour of the tree must be checked, by preventing all extravagant growth in the summer ; and with this view the trees must be frequently inspected during the months of April, May, and June, in order to rub off *every bud* threatening to come forth in a wrong place. And of those suffered to remain to form spurs, they should be stopped as soon as they have gained a length of six or seven inches. The leading shoots at the point of the branches are never stopped till they have gained their utmost limit, or till they interfere with other trees.

This dismemberment, performed annually, soon gets the whole system into a stunted or stationary state, and until this state of an espalier be acquired, it is never sufficiently fruitful.

As trees trained as espaliers are those called spur-bearers, and which spurs bear the flowers, they are particularly cared for in pruning ; always preserving those nearest the place whence they issue, so as to keep them snugly in line, and not dangling too far from the branches. The senior Mr. Harrison has given excellent directions on this branch of pruning fruit trees, and well worth the consideration of all engaged in the business.

Espaliers are planted at various distances, according to their natural volume ; but as the quality of the soil always determines the growth, it is not easy to fix a rule for inter-distances. In a kindly loam of middling quality and of moderate depth, the distances may vary from fifteen to thirty feet ; the nearer distances for plums and apples, the greater for pears and some sorts of cherries. Some trainers inter-mix the branches of proximate trees ; in which case they may be planted at first, nearer together. But it is a good plan to have super-numeraries ; the trouble of removing a tree from between two over-bearing, or valuable neighbours, is not great, and besides it gives opportunity for selecting those most worthy the station.

Whether trees be trained in the above described manner, or in any other way upon a rank of stakes, it is, it must be confessed, unnatural ; and many have thought, particularly among the French gardeners, that to see each tree insulated has a better effect on the eye of the spectator, as well as more natural for the trees to receive atmospheric influences on every side.

(*To be continued.*)

LANDSCAPE GARDENING.

LETTER NINE.

DEAR SIR,—In my last letter I led you through the pinery and grapery; I must now drag you through the peach-house into the open air. The peachery has the same form, and is of the same dimensions, as the pinery. The flues are built and conducted in a similar manner; and the means of admitting fresh air by the front lights sliding in grooves, and the upper lights of the roof moveable by lines and pullies, are also on the same construction.

The back wall is covered with a light trellis, leaning back over the flue, and covered with rider peach and nectarine trees from end to end; none of their branches being trained downwards lower than about four feet from the ground; because if lower than this neither the shoots nor fruit ripen kindly, in consequence of their distance from the glass and want of sufficient air; besides being too much shaded by the row of standard trees which occupy the middle of the house.

The trees on the trellis are trained in the usual manner. The principal branches being laid out divergingly, like the ribs of a lady's fan, and the bearing shoots are laid in the intermediate spaces. The great art of pruning a peach-tree in such a situation is, to keep up a continual series of young shoots, rising from as near to the summit of the stem as possible, to be led outwards to succeed the older branches, which may require to be cut out. This principle constantly acted on renders a peach-tree a perfect *proteus*, because it cannot remain for two years together exactly of the same form, or containing the same number of parts. The constitutional habit and manner of bearing of the tree renders this constant selection of its last produced shoots necessary, because on these only the flowers and fruit are borne.

On a well managed peach-tree, the shoots formed in the preceding summer are regularly dispersed over its whole expanse, and this is accomplished not so much by a judicious pruning in the winter, as by a proper selection of the rightly-placed buds and shoots soon after the commencement of the summer growth. At that season every healthy bud on the tree begins to move; if all were permitted to remain, the powers of the tree would be very unequally distributed. Some of the shoots would be misplaced or too strong, and the greater number would be too weak and unfit to bear a crop in the following year. But to prevent all such irregularity the gardener pays constant attention to direct the growth in its first stage; he selects only a certain number of

rightly-placed shoots to be trained to the trellis, to bear the next crop, and at the same time displaces every redundant or useless shoot. By this means the shoots which are left acquire the necessary strength, and the fruit then on the tree its full size and flavour.

The apparent health and strength of the trees is the criterion by which the manager judges of the number of fruit they should be allowed to ripen. A couple of fruit on every square foot of the trellis is a fair crop; and to this number they are reduced as soon as the crop is fairly set. More or less, however, may occasionally be considered a proper burden to be matured, according to the state of the tree, or to what the crop was in the year before.

The trees occupying the middle are trained as standards with the natural form of head. The stems are about two feet high, with branches extending all round. The heads are kept rather thin, and much care is bestowed in reserving the most conveniently placed bearing wood, and supporting or keeping them in due position by slender props stuck in the ground, or tying the shoots to each other by strands of matting.

All the trees are healthy, and seldom fail to yield fair crops. The house is never forced very early, nor immoderately; the object being to have a good, rather than an early, crop. The temperature from fire-heat begins with about fifty degrees, and is raised gradually till the fruit are stoned, and ripened off with about seventy or seventy-five degrees of heat. Fresh air is daily admitted, and the trees are frequently and forcibly sprinkled with water, or steamed, by pouring it upon the flues. If the green fly appear the house is fumigated with tobacco; and, if mildew assail, strong soap-lather is applied.

The soil in which the trees are planted is a fine mellow loam, and is kept in heart by additions of the same occasionally, and with always a surface covering of decayed dung all the autumn, when the trees are exposed to the open air.

Fig-trees, and vines in pots, are set in all the houses; together with French-beans and strawberries regularly. Cucumber plants raised in September are planted in a set of boxes placed on the back flues of the pinery; their shoots are trained on the back wall, and they seldom fail to yield a fruit, now and then, throughout the winter.

The business of all the houses is so systematically arranged, and duly performed, that it seldom happens there is any disappointment either in the expected amount of crops, or from loss of health in the plants. One very material thing which tends to secure this success, is the steady character, the long service, and happy situation of the old gardener, who neither fears nor wishes a change. He considers himself

—and is considered by all, as one of the family ;—a connexion which only extreme infirmity or death can dissolve.

There are no espalier trees across the upper end of the garden immediately in front of the hot-houses, but instead of them there is a double range of strawberry-beds, which have a very neat architectural appearance. The beds are formed upon ridges of rich loamy compost, the surface is covered with paving bricks, laid like steps along the sides and ends, with vacancies left for the insertion of the plants. Along the crown of the ridge a narrow channel is formed to receive water, whence it percolates into, and down the sides, of the body of earth. The paths round the beds are laid with foot paving-tiles, and the beds are renewed alternately with young plants every second or third year.

The advantages of growing this delightful fruit in this manner are several. In the first place, the fruit are always perfectly clean and perfectly ripened from the reflective surface of the bricks ; they are also easily gathered, and less liable to be preyed on by insects ; and slugs, snails, and earth-worms are banished by two or three lavings of lime-water, applied just before the flowers come forth. To company wishing to help themselves these raised beds are particularly convenient, and the general cleanness and comfort about them makes such exercise doubly inviting.

There is no other object in the kitchen garden which claims to be particularly noticed, nor is it necessary that I should describe the various operations and methods of culture pursued here. All that need be added is an expression of admiration and approval of the regular routine of business incessantly carried on, in obtaining every product of a well conducted kitchen garden.

The slips on each side of the walled garden are useful appendages ; not only because they allow both sides of the wall to be used for wall-fruit, but because they give space for the reception of fruit-bearing trees and shrubs, which would disfigure or injure the crops of the compartments within the walls. And, moreover, sheltered and useful borders are gained for the culture of extra crops of the more valuable dwarf-growing vegetables. For the latter purpose the borders next the walls are employed. Parallel thereto are gravel walks, six feet wide, to admit a cart when necessary. The space between the walk and holly-hedge, bounding the pleasure-ground, is occupied by three rows of fruit-trees, as follows :—

At the distance of seven feet from the edge of the walk stands a rank of dwarf apple-trees, twelve feet from each other, reaching the whole length of the garden. Behind these, and at a proper distance, there are two rows of raspberry plants, of equal length ; and farther back, and

near the hedge, stands a row of black currants. These fill up the east slip.

The apple-trees are all the dwarfer growing sorts, and are kept pruned like a bush; not allowed to rise higher than about six feet, and every means taken to check luxuriant growth and preserve a dwarfish habit. This induces fruitfulness, while they are constantly under command of both eye and hand. Such a rank of trees at equal distances, and of uniform size, are highly ornamental when in bloom, and a rich spectacle when bending with fruit. To keep them in the desired character certainly requires much care, but they are well worthy the labour bestowed.

The raspberry and black currant-trees behind, are pruned in the usual manner; but the former are trained to a slight post and double rail fence, placed close behind the row of plants.

The west slip is planted in an exactly similar manner, but the kinds are not the same. The front row are dwarf pears, cherries and plums, and the three back rows are gooseberry and common currants. Rows of strawberries are planted within a foot of the walk in both slips, and sometimes rows of late broccoli are dibbed in between the ranks of trees.

This disposition of the slips is convenient in having the different kinds requiring the same treatment near together, and their occupying the strip of land between the pleasure-ground and kitchen-garden forms no very incongruous step from the one to the other.

I have next to speak of the orchard at the top of the garden. This, as you will perceive by the outlines already sent you, is a semicircular space of ground, of which the width of the garden is the diameter. The ground was prepared by trenching about sixteen inches deep, the soil a mellow loam on a dry gravel. The trees are planted in curved lines ranging parallel with the exterior boundary. The outer row are baking pears, walnuts, caroon cherries, and damson plums, as being the tallest growers. The next row within, are the tallest growing sort of apples, and the other more central rows are the dwarfer kinds. In the openings all over the surface, filbert-trees trained like low bushes, are dotted, together with two or three mulberry-trees. The whole orchard is in grass, and mowed occasionally; the trees are generally healthy, and when the season is favourable they bear plentifully.

Thus have I given the various features of the kitchen and fruit gardens, from which you may have gained as perfect an idea of this portion of the estate as is necessary in conveying to you a general view of the whole. Our next excursion will be in the park.

Yours, &c.

A. B.

ENTOMOLOGY.

THE next insect whose depredations are seriously injurious to fruit trees and other plants, is what is commonly called the *Red Spider*. *Acarus talarius*, Lin. This however is a misnomer, as the insect is not a spider at all; but because they have the power of forming something like a web, when allowed to remain long on the same leaf, they have had this name given them. They belong to the apterous genus *Acarus* of Linnæus, and of which there are many species, some of them so exceedingly minute as to be scarcely visible to the naked eye. One species, supposed to be particularly partial to the leaves of kidney-beans, will however leave this food for the delicate skin of a young lady or child, into the pores of which they will insinuate their little beaks, and seat themselves for days together, causing considerable irritation and inflammation, and at the same time safe from every effort of the sufferer to dislodge the little pest, or even to see, without a magnifying-glass, the cause of the teasing sensation. This is called the *Harvest-bug*, by those who perhaps never saw the insect, or know that they may be extracted by the point of a muslin needle.

The gardener's enemy is a size larger than this; but they are much oftener discovered by their depredations, than by their bulk, either individually or collectively. When very young they are colourless, when half grown they are red, and when full grown dark brown. They infest peach, nectarine, and vine trees, both in the house and in the open air; and are often troublesome in hotbeds, on the leaves of cucumbers and melons. Stove-plants are particularly subject to them, and especially on some of the spinous succulents, which neither admit of them being brushed or washed off.

This insect injures plants by puncturing the cuticle of the leaves and tender shoots, and very probably by sucking the juices, as after their attack the leaves become paler, and cease to have a healthy appearance. Indeed, the whole tree puts on a sickly habit, and consequently the fruit are small and tasteless. When suffered to increase and establish themselves, on a vine-leaf for instance, they make for themselves little bridges of fine silk-like webs, from one prominence on the surface of the leaf to another, along which they journey forwards and backwards. The web seems to be a defence against moisture, but whether it be spun from the mouth, as by some caterpillars, or from the abdomen, like the common spider, is uncertain. It is not intended, like that of the spider, for entrapping prey, but rather as a kind of dry nest for their eggs or young.

Water and a moist atmosphere is their bane, and more especially if

water be forcibly applied ; by this they are dispersed and annoyed, and if frequently so disturbed are at last completely banished. It is also said that if a house infested by them be filled with steam, raised from highly heated flues, and closely shut up for an hour or two, they will be destroyed; or if the house be filled with the fumes of sulphur smeared on a hot flue, the result is equally fatal to the *Acarus*.

By these means, timely and repeatedly administered, plants in houses may be kept free from this little plague, and so frames may be defended from them ; but if they take to peach or other trees on the open walls, the garden water-engine must be in frequent requisition to disperse them.

The above history relates to that species of *Acarus* better known by the name of Red Spider. Several others are found in gardens and fields, but they are unnoticed except by entomologists, because they do no very visible mischief. Some of them live among decayed vegetable matter, and others on the leaves of grass. Those yellow patches seen in the herbage of a meadow in the month of October, are caused by colonies of these *Acari*, which deprive the grass of its colour.

The deciduous bark of the vine forms a safe hiding-place for insects of this small size during winter ; and therefore there is not a more beneficial practice in the culture of that plant, than keeping it constantly free from the loose strips of dead bark.

We know nothing of the economy or natural history of this genus of insects, further than is stated above. Whether oviparous, like the spider, or viviparous, like the *Aphis* during summer, is to us unknown. An entomologist who has leisure, and who can have access to a peach-house during the three first months of forcing, and furnished with a powerful glass and a good share of acuteness and patience, might probably (if it be not done already) see into their economy so far as to be able to assist the gardener either to keep them off, or to destroy them in the first stage of their life.

An equally pernicious insect among stove-plants, is another one called the *Thrip*. It is of a pale greenish-white colour, smaller and longer shaped, and more active than the *Aphis*.

(To be continued.)

SIR,—In your last number I perceive that you request information as to the characters of the genera of *Aphis*, *Coccus*, &c. Should no one else have responded to your call, the following descriptions are much at your service.

The British *destructives* in question belong to the order *Hemiptera*

of Linné, and are arranged by modern Entomologists under four families:—

4. PSYLLIDÆ, *Latr.* containing the genera PSYLLA, *Geoff.* (CHERMES, *Linné*,) and LIVIA, *Lat.*
5. THRIPIDÆ, *Steph.* ? containing the genus THIRIPS of authors.
6. APHIDÆ, *Leach*, containing the genera APHIS, *Linné*; ERIO-SOMA, *Leach*; and ALEROYDES, *Latr.*
7. COCCIDÆ, *Leach*, containing the genera DORTHESIA, *Bosc*, and COCCUS, *Linné*.

These genera may be made out with very little attention, by the following characters, and by the assistance of the figures referred to, which will nearly all be found in English works. I leave the detail of the injuries occasioned by them, and the remedies for those injuries, to your able pen. At the same time, I would suggest, that any remedy applied for the destruction of these pests, can only prove effectual when the young are just hatched, and leave the mother; for nothing short of scraping them off the plants will avail, after the females have “settled for life.”

I. Fam. PSYLLIDÆ, *Lat.* ORDO HEMIPTERA, *Linné*.

Antennæ, with ten or eleven joints; *legs* formed for leaping. Both sexes with *wings*.

1. Gen. PSYLLA, *Geoff.*; CHERMES, *Linné*.

Snout (rostrum) bent under the breast; *antennæ* longer than the thorax; *wings* four, deflexed; *thorax* gibbous; *feet* formed for walking and leaping.

Ex. P. BUXI, *Linné*. *Wood's Illustrations of the Linnean Genera of Insects*, vol. i. p. 114, pl. XL.

Twenty-four indigenous species have been described or indicated in various works; but this, doubtless, falls very short of their actual number.

2. Gen. LIVIA, *Latr.*

Antennæ shorter than the thorax, the base much thickened even to the middle; *thorax* with the anterior segment transverse, straight.

Ex. L. JUNCORUM, *Latr.* *Sam. Ent. Comp.* pl. V, f. 11. Inhabits rushes. But one British species known.

V. Fam. THRIPIDÆ, *Steph.* ?

Antennæ eight-jointed.

1. Gen. THIRIPS, *Linné*.

Snout (rostrum) secreted within the mouth; *antennæ* the length of the thorax; *body* linear; *abdomen* inclining upwards; *wings* four, straight, long, incumbent on the back, narrower than the body, slightly crossing.

Ex. T. PHYSAFUS, Linné. Wood, vol. i. p. 118, pl. XLII.

It is not improbable but that each genus of flowering plants (if not each species) may have a species of *Thrips* peculiar to it; British writers, however, have noticed but nine species of this genus: they are all, doubtless, injurious to plants in bloom. The above example is said to inhabit rye, and to destroy the spikes.

VI. Fam. APHIDÆ, *Leach.*

Antennæ with six, seven, or eight joints; females generally wingless.

1. Gen. APHIS, *Linné* (Plant-louse).

Snout (rostrum) bent under the breast; *antennæ* longer than the thorax; *wings* four, or wanting; *feet* formed for walking; *abdomen* mostly furnished with two horn-like processes.

Ex. A. ROSÆ, Linné. Wood, v. i. p. 112, pl. XXXIX.

These pests are exceedingly prolific. Réaumur proved by experiment, that one *Aphis* may be the progenitor of 5,904,900,000 descendants, during its life; and further supposes that in one year there may be twenty generations. For its history, and many very curious and interesting details, see the sixth volume of the Linnean Society's Transactions; Bingley's Animal Biography (12mo ed.), vol. iv. p. 73, and Extracts from Réaumur and others, respecting this, and allied species and genera in Rennie's Insect Architecture, Transformations, and Miscellanies.

But forty-eight British species have been noticed. It is not improbable but that nearly every species of plant may have its peculiar species of *Aphis*.

2. Gen. ERIOSOMA, *Leach.*

Snout (rostrum) bent under the breast; *antennæ* short and thread-shaped (filiform); *body* covered with a soft down or wool.

Ex. E. MALI, Leach; LANIGER, Illiger. 2 Hort. Trans. 162. pl. XI. Rennie's Insect Miscellanies, p. 179. figs. a. b. c.

"The *Eriosomata* form what are called improperly galls, on the stalks of trees near their joints, and knobs, which are in fact excrescences caused by the efforts of nature to repair the damage done to the old trees, by the perforation of those insects, whose bodies are covered with down."—*Leach.*

Twelve species only have been enumerated; no doubt they are much more numerous.

3. Gen. ALEROYDES, *Latr.*

Snout (rostrum) bent under the breast; *antennæ* six-jointed,

short, and thread-shaped (filiform); *wing-cases* and *wings* of equal size; *body* mealy; *eyes* two, each divided into two.

Ex. A. CHELIDONII, Latr. Réaumur's Genera Insectorum, pl. XXIII. f. 18.

I am not aware of any English figure of this insect. One species (*A. Proletella, Latr.*) is said by Kirby and Spence (*Introduction to Entomology*, vol. iii. p. 89,) to lay 200,000 eggs. The species are very minute, and many have probably escaped observation; five only having been named.

VII. Fam. COCCIDÆ, Leach.

Snout (rostrum) only in the female; *wings* in the male, but no wing-cases; female wingless.

1 Gen. DORTHEZIA, Bosc. (scale bugs).

The body of the animals of this genus is covered by a number of cottony or waxy laminæ, which partly cover each other, and are arranged usually in a triple series. In character and habit allied to *Coccus*.

Ex. D. FLOCCOSA, De Geer. Mémoires pour servir à l'Histoire des Insectes; par Charles de Geer, vol. vii. p. 604, pl. XLIV. fig. 26.

I know of no figure in any English work; six species only of this genus have been noticed in Britain.

2. Gen. COCCUS, Linné. (scale bugs).

Snout (rostrum) bent under the breast; *antennæ* thread-shaped (filiform); *abdomen* of the males with two long bristles (setæ); *wings* in the males two, erect; females without wings.

Ex. C. FRAGARIÆ, Gmel.? Phil. Trans., vol. cli. pl. X.

Some interesting notices of several species of *Coccus* occur in Bingley's *Animal Biography* (12mo ed.), vol. iv. p. 78 *et seq.* Rennie also states some facts from Réaumur, *Insect Transformations*, p. 87, and has figured *C. cacti* at p. 89.

Upwards of twenty species are natives of Britain, and doubtless many more would reward the assiduous collector.

I cannot agree with you, at p. 57, that the colours of the different species of *Aphis*, are owing to the quality of their food. They are doubtless distinct species, and their food has nothing to do with their colour; although *age* may, in a slight degree. In both animals and plants we find that individuals of very diversified colours affect an identity of pabulum.

Yours &c.,

Δ

February 16th, 1836.

MISCELLANEOUS INTELLIGENCE.

EXTRACT OF A LETTER TO THE EDITOR.—Sir,—Pray allow me to make a few observations on your paper relative to the “physical structure of plants” in your February number. In that paper you have quoted Burnett, and given sketches of that author’s distinctions of the *Quercus pedunculata* and *Q. sessiliflora* (page 47). This is all very well, but on turning over the Gardener’s Magazine, received at the same time, I got my eye on an excellent paper on the subject of oak timber, written by W. Atkinson, Esq., than whom there is not, perhaps, a better judge of the qualities and properties of timber in the kingdom. Here, however, I felt sorry to observe that Mr. Atkinson’s ideas were at variance with your own, or, if you please, with your authority, the late Professor Burnett. Now, as you yourself have properly observed that this very subject is of national importance, it is highly necessary that there should be no shadow of doubt to perplex the mind of the planter “whether of the twain” he should prefer, while in the act of planting for posterity.

Should you be pleased to excuse this little critique, and receive it in the spirit in which it is written, I shall feel gratified; more especially if it elicit from your pen any further remarks on this interesting subject.

I am, Sir, yours, &c., A. S.

Berks, 5th Feb, 1836.

In answer to the above friendly observations, we can affirm with great truth, that we really feel under obligation to A. S. for his hint; as on turning to the Gardener’s Magazine ourselves, we find his remarks perfectly justifiable as to the discrepancy of the ideas to which he has so candidly alluded. And we would be extremely culpable indeed, were we by any inadvertence to disseminate error on such a vital question. The fact is, we have been long acquainted with this controverted point as to the identity of the true old English oak, whether the *Quercus robur* be what is called *pedunculata*, or that designated *sessiliflora*; whether these be species, as some botanists make them, or only mere varieties, as others conceive them to be, and for this reason, that the distinctions are often present on the same tree.

Amidst this uncertainty about the oak, we certainly did refer to Burnett’s Botany, not because we considered that lamented author as a first rate authority as a practical botanist; but knowing his indefatigable industry as a learned compiler, and knowing that he had previously published *Amœnitates Quernæ*, we naturally concluded that he

had consulted all the best authorities on the subject, and therefore quoted him.

But we do not consider botanists, whether practical or literary, so good judges of timber as a gentleman like Mr. Atkinson, whose business has so long and so directly led him to study the comparative character of the different kinds of timber used in buildings ; and from the particular attention which he has paid to ascertain which species or variety of British oak is really the most durable, we cannot for a moment doubt but that his conclusion is correct.

The "silver grain," alluded to by Mr. Atkinson and many former writers, are, we suppose, the concentric rings of cellular membrane which distinguish or divide the annual growths from each other ; and are, we apprehend, what the workmen call "the flower of the wood" when exposed by the plane. These divisions are all nearly of equal thickness in the same butt of a tree which has grown freely ; but they differ very much on panels cut from the same butt. If a panel be cut directly through the pith, the graining, or flowering of the wood, will appear in nearly right or wavy lines from top to bottom ; but if cut from near the outside, or just within where the slabs were sawn off, then the cellular divisions, or silver grain, occupy full one half of the whole surface after it is planed ; and merely because in the first case the saw passes through the divisions at right angles, whereas in the last case the saw cuts through obliquely, and consequently exposes more of the circumferential dimension.

Mr. Atkinson remarks that the *Q. pedunculata* presents more of this silver grain than the *Q. sessiliflora*, in parts (we suppose) cut from the same parts of the butts respectively. This we cannot doubt ; and the reason may be, that the former has thicker or more substantial cellular divisions than the latter, it being impossible there can be a greater number, especially as Mr. A. adds that the *sessiliflora* appears to grow as fast as the other. Another thing which may tend to increase the silver grain of the *pedunculata*, is, the well-known circumstance that the common oak makes two growths in the course of the summer, namely, the spring and midsummer shoots ; and as the tree makes a pause before the midsummer shoots come forth, that pause will be marked by a thinner concentric line or division, when the timber is worked up. We have examined many oak trees for the purpose of guessing their age by counting the concentric layers, and, if we did not pay attention to these intermediate midsummer lines, we were very liable to over-date the age of the tree.

We can corroborate what Mr. A. has advanced respecting the

difficulty of distinguishing the timber of the sweet or Spanish chestnut, from that of the old English oak ; and we have been informed by an intelligent carpenter, employed in the repairs of Westminster Hall, that both these kinds of timber are met with in the oldest parts of that building, but so like in the grain, ponderosity, and sound condition, that they could not be distinguished from each other but by a very simple test, namely, by wetting a chisel in salt and water, and striking it into the wood : if the tool came out and remained bright, the wood was chestnut, but if stained of a dark colour, the wood was oak.

This story we give as it was reported to us by a most respectable man ; but we think that if such a test was known to one, it must also have been known to many ; and that as Mr. A. does not seem to be acquainted with either the test or the circumstance of chestnut timber existing in Westminster Hall or any other old building, we would rather be inclined to doubt the truth of the carpenter's story.

Thus the long-continued controversy about the identity of the British naval oak, and all doubt concerning the true sort, is now, happily, at an end. We, therefore, particularly recommend to all collectors of acorns for sowing, to pay attention which sort they gather from, to choose the stalkless acorns, and not those on long foot-stalks. The same advice we would urge on nurserymen, on whom a heavy responsibility will rest if they knowingly raise and sell *Q. pedunculata*, for the *Q. sessiliflora*.

We hope our correspondent will accept this our reply, as a correction of anything which we ourselves may have advanced on the subject, or have quoted from others ; and with repeating our thanks to A. S. (with whom we have a desire to be better acquainted,) for pointing out the discrepancy, we remain, his obedient servant.—ED.

REMINISCENCES OF A VOYAGE TO AND FROM CHINA—(Continued). The Cape of Good Hope is no less interesting to the botanist, than it is to the navigator. To the latter it is the extreme southern point of Africa, round which is the highway to the riches of the East, and to the former it is the habitat of as great a variety of vegetable productions, as is found on any equally extensive portion of the earth's surface. The botanical stranger is first struck by the appearance of the British oak shading the streets of Cape Town ; and on the level between the town and the Table mountain, finds it the principal tree of the groves. In the enclosures, orange and lemon and other European fruit-trees prevail ; and under them, water-melons and many varieties of the *Cucurbitaceæ* cover the ground. The native plants on the uninclosed

spots are, *Proteas*, *Mimosas*, *Ericas*, &c. ; but the chief station of the *Ericæ* is the tops of the mountains in this very mountainous country.

Among other European fruits, the Dutch planters have not forgotten the grape-vine ; extensive vineyards exist in the interior, from which considerable profits accrue to the planters, who drive a pretty fair trade in Constantia and Cape Madeira wines for exportation. These vineyards we had no opportunity of seeing, but were told that the same culture is bestowed as is practised in the vineyards on the banks of the Rhine.

The ship's course from the Cape was easterly, and in about 40° south latitude, until the longitude of Madras was gained ; and luckily, at this very point, the south-east trade-wind was met, which carried us directly north, past the east side of the Island of Ceylon, to our destined port.

On our arrival at Madras (3rd April, 1793) the whole of the plants were in a sad mutilated condition. The sudden transition from the cold of a British winter into the heat of the torrid zone, within the space of twenty-eight days, excited them into a rapid growth, which their roots were not in a condition to uphold, and the shoots and leaves they did put forth, being of the most delicate texture, withered altogether in doubling the Cape. And though some of them showed signs of returning health when we again crossed the tropic of Capricorn, few of them were worth carrying on shore at Madras. Gooseberries and currants quite dead ; peaches and nectarines dead down to the bud, and their stocks hardly alive. Pear and apple trees looking pretty well ; these last were sent on shore and presented to the Nabob of Arcot, then living in the vicinity of Madras.

The closely packed box which had been kept in the hold, agreeably to the wish of Mr. Loddiges, was opened on our arrival here, and found a complete failure. Every particle of moisture was exhaled ; and the juices of every plant had vanished, except in one instance, which was in a thick stump of the root of a common laurel. Had means been used to keep this box in a damp state, I have no doubt that many of the plants would have arrived in a recoverable state.

As the plants which we carried out were only for the purpose of experimenting upon, no regret or disappointment was felt at their failure. Their fate taught us that European plants intended for such a voyage should be such as have been established in pots for a year or two before they go on board ; and instead of leaving Europe in the depth of winter, a better season would be nearer midsummer.

Our approach to the Indian coast was most interesting, and any one who considers the length and difficulties of such a voyage must be

astonished at the accuracy with which the ship was navigated to her anchorage before the landing place at Madras; for it did not appear that, from the moment we bore up from the latitude of forty degrees south till we cast anchor on the coast of Coromandel, the vessel had been navigated a hair's breadth out of the direct and nearest course. Full justice cannot be done to such a commander unless we are acquainted with all the disturbing causes which affect a ship's course. The flow and ebb of tidal and other currents, the variation of the compass, the errors of lunar tables and charts, and false estimate of a ship's trim, are all circumstances for which correct allowance must be made in order to be able to keep the vessel in her right course. That this was done with the greatest exactness we were witness to, nor at this distance of time has the impression of admiration we then felt entirely subsided.

Madras has no harbour, but has an open roadstead on an extended level shore, covered chiefly with groves of cocoa-nut trees. Landing through a heavy surf is not a pleasant matter to a timid stranger; for though there is no serious fear of loss of life, there is every chance of a good ducking. The skill and amphibious character of the poor naked creatures, who guide the large tub-like boats on the tops and in the shallow valleys between the impetuous waves, is our security; and they seldom fail in taking advantage of a careering wave to land high and dry upon the beach.

Stepping on *terra firma* after what may be called a three months' voyage gives wonderful alacrity to the mind which had long panted to be again among green leaves and flowers. The crowds and different castes of officious *dubashes* in their effeminate muslin dresses which surrounded us—the port-authorities—and the massive ramparts and numerous buildings, forming a stately stronghold of British dominion, which received us were scarcely noticed; our eyes were turned to other objects, and fixed on the lovely *Neriums* then in full bloom,—the *Hibiscus Rosa sinensis* and lofty *Carica papayas* which grew in some of the court-yards of the houses in the fort.

Favoured by being attached to the captain's household, we had no care about either lodgings or board, and in this way being settled at once, had only to hire a personal servant, and palanquin boys to carry us whither we wished to go.

We have no wish to lengthen this narrative by matter extraneous to the main object of our mission, but cannot help adverting to our sufferings during the first night of our residence at Madras. Like all other voyagers on their first visit to almost any place between the tropics, we were apparently a rich treat to the musquitos, which literally

fill the night air with their numbers and noise. Sleep fled from our pallet; and though we had taken the precaution to anoint every exposed part of our body with lime-juice, yet long before the return of morning we felt that we were ornamented with many embossings which we never had before. The musquito of India and the large spotted-leg gnat of England are the same species.

On the next day after our arrival we received an invitation from Dr. James Anderson, Physician-General to the Forces, to pay him a visit of a few days at his villa near Madras. This we willingly accepted, and not only for reconnoitring the woods and jungles of the country, but for the pleasure of seeing the Doctor's fine collection of plants, which he had collected from all parts of hither India. We met a most cordial reception, as well from the Doctor himself as from his nephew, Mr. (afterwards Dr.) Berry, who was then staying with him. Both these gentlemen were good botanists, and from them we learned many particulars relative to transporting seeds and plants.

Dr. A. was then busy in introducing the silk-worm and its management into that part of India, and had large buildings and many hands employed in the business, and, when we were there, with every prospect of success.

We were also invited to visit J. Call, Esq., who had fine gardens laid out in the English manner—groups of trees, and clumps and borders of shrubs and herbaceous plants of all the choicest natives of India, as well of the adjacent countries.

We also visited the venerable Nabob of Arcot at his palace a few miles to the westward of Madras. His Highness had some idea of sending us to Arcot to superintend the planting of the apple trees which had been presented to him. We had the honour of conversing with his Highness in English about the treatment of European fruits in India in the midst of his courtiers. He was then about eighty years of age, and certainly the most majestic personage we ever saw. There was every sign of oriental grandeur within the palace, but nothing to attract the eye of a botanist. His stud of elephants and collection of royal tigers were, however, imposing sights to a stranger. Having explained to one of the linguists what should be done with the trees, the idea of our proceeding to Arcot was abandoned.

We were next invited to spend a few days at an estate belonging to Mr. Solicitor General Popham, at Vellore, thirteen miles to the north-east of Madras, to assist that gentleman with our advice in forming an extensive plantation of the Bourbon species of the cotton tree. Here, in the midst of extensive jungle, and where cultivation had not much changed the natural face of the country, we remained three weeks,

and did the proprietor considerable service, for which he amply rewarded us.

Returning to Madras, we were immediately ordered on board ship. A great change had taken place. The Governor-General Cornwallis had determined to attack the French settlement of Pondicherry. General Braithwaite was ordered to invest it with troops by land, while our ship and two other Indiamen which had arrived out after us, were taken up and fitted out as frigates to form the blockade of the place. We were put, under the orders of Rear-Admiral Cornwallis, who then commanded the *Minerva* frigate, the only British ship of war then on the Indian station. This was an arduous though not a dangerous duty for the crews of the blockading ships. Preventing supplies intended for the place was mostly night work; but no resistance was offered to our boats in the performance of the duty of seizing an unarmed open boat, loaded with a few buffaloes and a few bags of rice.

After lying before the place for a week or ten days, in which time we saw all the operations and some of the calamities of a regular siege, the *Triton* was suddenly ordered away to Calcutta to escort the Governor-General to the seat of war. We were soon at anchor in the mighty Ganges, and lay at Kedgerree until the Marquis and suite embarked in two other ships, and joining us, we all three returned first to Madras again, and next day to our station before Pondicherry. The place in a week afterward capitulated, and the British flag floated over the captured town.

After this event we were set at liberty to prosecute our voyage; and at last sailed from Madras in company with the *Royal Charlotte*, Capt. Price, and Warley, Capt. H. Wilson, all bound to China.

The reader will excuse this rambling account of the movements of the ship, instead of details of the botanical discoveries we made, which is the more immediate purpose of our narrative, but we cannot do the one well without introducing somewhat of the other. We have a list of the names of plants we met with in Hindustan now before us, but which we think unnecessary to transcribe, not only because it would take up too much space, but also because it would only be a transcript of a great majority of stove plants which may be seen in any exotic nurseryman's catalogue. We shall, however, select a few, not for their novelty, as they have been long in British collections, but because we consider them among the most splendid flowering plants of that part of India; and which, moreover, might be cultivated to greater perfection in this country than they have heretofore been. These are as follow:—

Renecalmia exaltata; *Nyctanthus sambac*; *Justicia coccinea*; *Eschynomene grandiflora*; *Ixora coccinea*; *Nerium Oleander*; *Plumieria alba et rubra*; *Cerbera laurifolia*; *Tabernaemontana coronaria*; *Gardenia florida*; *Gloriosa superba*; *Bauhinia racemosa*; *Poinciana pulcherrima*; *Averrhoa bilimbi et carambola*; *Eugenia Jambos*; *Lagerstræmia Indica*; *Bombax Ceiba*; *Hibiscus Rosa Sinensis*; *Thespesia populnea*; *Erythrina corallodendrum*, &c. The above are what may be called the most ornamental plants in the gardens about Madras; and though many of them are occasionally flowered in our stoves in this country, no conception from these specimens can be had of their glorious appearance in that climate.

Their fruits are excellent and numerous: the shaddock, or pom-melmoe, as it is called by the Portuguese residents, is the most magnificent of fruit trees—the bulk and very regular rotundity of the head, the amplitude and deep green of the foliage, and the size and rich colour of the fruit, combine to make it one of the most attractive of plants. Next the mangoes, guavas, dates, jacks, limes, cocoa-nuts, &c., of the woods, and the pine-apples of their gardens, are all in abundance. Their culinary vegetables are yams of excellent quality, rice (the staple food of the country), the unripe fruit of several species of *Solanum ovigerum*, or egg-plant, and those of *Averrhoa carambola*. As greens they use the leaves of *Arum*, or *Caladium esculentum*, and as spinach the leaves of the *Amarantus oleraceus*.

Our direct course to China lay through the Straits of Malacca, that is, between the large island of Sumatra and the Asiatic main. This narrow sea is studded with numerous small islands and islets, all of which, as well as the continental shore, bear a thick and lofty mass of luxuriant vegetation. At some distance within the entrance into the Strait from the Bay of Bengal, lies Pulo Penang, or Prince of Wales Island, then an infant settlement belonging to the East India Company. Here we remained for a week or ten days, during which period we were almost constantly on shore, roaming about as far as we durst venture into the woods and wilds of the island.

The character of the trees, shrubs, and herbage on this fertile spot is much like that which prevails over all that part of the East. The *Tectona grandis* is one of the largest trees. Palms abound, and particularly the areca, which yields the betel-nut, and from the prevalence of which the island has its name, Pulo Penang, signifying the Island of betel-nut trees. Here are also many varieties of the genus *Ficus*, of very large size, together with *Michelia*, *Tamarindus*, *Artocarpus*, *Anacardium*, *Annona*, *Bombax*, *Calophyllum*, *Carica*, *Caryophyllus*, *Citrus*, *Dioscorea*, *Eugenia*, *Garcinia*, *Laurus*, four species, *Lycium*, *Mangofera*,

Melicocca, *Guilandina*, *Musa*, *Myristica*, a wild species bearing inferior nuts, and many other well-known genera.

Among the plants new to us we find memorandums of a tree profusely covered with spikes of flowers resembling those of the *Catalpa* in *Pentandria Monogynia*; a shrub as showy as the *Rhododendron ponticum*, belonging to *Decandria*; another shrub with procumbent branches covered with dark purple pentandrious flowers; a beautiful tree with smooth compound leaves like those of the walnut, and bearing long pendent racemes of bright yellow flowers, *Decandria Monogynia*.

We collected many seeds and specimens at this place, but could take no plants on board. This island, from its rich soil and non-liability to drought, promises to be a fine field for the introduction of every valuable plant found in the same latitude, as spices, dye-stuffs, drugs, &c., and besides the hills are said to contain some rich veins of tin.

(To be continued.)

GARDENERS' SOCIETIES.—In our two or three preceding numbers there have appeared communications from several of our readers on the subject of gardeners' societies. They all regret the apathy of their brethren relative to such associations; and consider it a serious loss to the whole fraternity that there is no such thing on the western side of the metropolis, where there are so many nurseries and gardens employing many young men in pursuit of their business, and who would most probably be glad to unite themselves with such a society. Some associations of the kind already exist in the eastern and northern suburbs, and therefore the want of something similar on the western side is most severely felt. It is astonishing, they say, that while almost every other grade of the labouring population have their clubs, or fixed places of resort to meet their brethren, the gardeners alone are a dispersed flock of individuals, without any bond of union or common means for facilitating either professional or even social intercourse.

Trades' unions are happily almost done away with; but they have still their houses of call. These associations are formed for very different purposes than would appertain to a society of practical gardeners. The former are for defining and protecting their professional rights, real or imaginary. The latter would be for personal intercourse, mutual instruction, and rational as well as profitable recreation.

Man is a social being, and in the intervals of labour must rely on his own resources for amusement, either by reading or by seeking congenial society, where he may relieve his mind of cogitated ideas, or refresh or improve it by the oral intelligence of others. If he seek

this recreation in the mixed society of a tavern (and such may always be found), he most likely will either be disgusted by the reveries of a pothouse politician, or annoyed by the private squabbles of the neighbourhood, in which he has no concern. But provide for this person a private room, where he might always find new books and occasionally meet a company of brethren, he would feel himself at home; because he would be among those who, like himself, are in quest of mental and professional improvement, all equally willing to give and receive information, all intent on the same objects, and all progressing to the same goal. Even the ordinary conversation of a company of men engaged in the same occupation must be mutually advantageous: many observations may be made in conversation merely as simple reports, and if corroborated, or differently accounted for by any of the hearers, might lead to the establishment of a practical principle, unthought of or unnoticed before.

Now, if such accidental results flow from unpremeditated conversation, how much more might be expected from conversation conducted under judicious regulations? A previously agreed-to code of rules would declare the privileges of members taking a part in the conversation or proceedings of the society; and these rules attended to by the members, nothing but the strictest decorum would prevail. Besides, in this case, many would come prepared with a question to be discussed (and put either orally or written), or with an answer to what had, perhaps, been before mooted in the society. Such opportunity afforded for mutual interrogation and reply, for statement and re-statement, for propositions and disquisition, would be a high intellectual treat;—and would, moreover, exercise and habituate the mental faculties of the members to look for *causes* as well as the *effects* of practical rules of gardening, as well as of all vegetative phenomena occurring in their business.

In short, such a society, well organised and conducted, would be attended with many advantages to both old and young men; for, besides the mere pleasure of social intercourse, it would diffuse benevolence and promote good fellowship—virtues particularly necessary among the fraternity of gardeners.

Seeing then how useful such an association would be, we would rejoice to see something of the kind set on foot in the proposed district, and readily promise that whatever preliminary steps be taken towards the accomplishment of the object shall be duly announced in the Register.—Ed.

ON GARDENERS' SOCIETIES.—Sir,—It gives us much pleasure to see in your two last numbers the lively interest which has been taken upon a subject, which must be of vital importance to every friend of

horticulture. It is a cheering thought, that the spirit of improvement is propelled with accelerated movements ; and still more so, when I am able to inform those friendly to the cause, that Mr. Fish's excellent letter has been the means of awakening the minds of two distinguished individuals, members of the L. H. S. and Z. S., who have come forward to give their approbation and support to the cause ; being fully convinced that public spirit is a perennial source of happiness to men, who, by embracing every opportunity to increase and encourage the operation of this noble disposition, and despising that narrow-minded selfishness, which has been alluded to in a former letter, and, moreover, opposed to that class of individuals who are still the enemies of gardening periodicals, or any other publication which has for its object the enlightenment of its professors. Such sceptics tell us these works have been the ruin of our profession. What, I would ask, would have been the intellectual state of society had it not been for those publications ? They have rendered the fountains of information accessible to all, and given opportunity to the poorest of our race to slake their mental thirst at those streams of intelligence, which are, and will be, the means of elevating the intellect of man to a state that nothing but superior minds are able to appreciate.

Such calumniators must be informed of their error before their prejudice and delusions are dispelled, as now the "schoolmaster is abroad," ignorance is a deep reproach, and individuals who can suffer opportunities, which they have within their reach, to pass without taking advantage of them is a pitiable spectacle of doltish inanity. Cultivate then a taste for improvement ; and in order to this, there must be a thirst after information, as it is a well-known fact, that knowledge is power, and if it were not so, it is pleasure : it gives weight to character and procures respect ; it will enable us to form an opinion with correctness—to state it with clearness—to offer it with confidence—and to enforce it with argument ; it enlarges the sphere of our usefulness by raising the degree of our influence. It is a pitiable thing to see rational beings so irresolute as almost to wish they could exchange reason for instinct, in order that they might be spared the trouble of thinking. Those, however, whose minds are differently framed need not be deterred from an attempt to accomplish the object first alluded to, and which so many think desirable. A steady resolution, under the impression that it is our duty to be serviceable to each other, whether that duty be pleasant or irksome, should banish all lukewarmness, and encourage us to proceed in forming such a society as promises so many advantages.

Yours, &c. A. WALKER.

Chelsea, 15th Feb. 1835.

IRREGULAR METAMORPHOSIS OF PLANTS.—It is probable that all plants have a particular range, in some cases more extended than in others, to which they are best suited in consequence of their constitutional peculiarities, which become visible from the effect produced by a change of situation, although not appreciable otherwise. The two great agents by which they are affected, that is to say, soil and atmosphere, will, in their natural situations, be nearly uniform. And as long as this uniformity of the conditions under which they exist continues, their structure will remain unchanged: but let an alteration take place; their atmosphere, for instance, change from that of the valley to that of the mountain; the soil from alluvial deposit to chalk or slate, and the mean temperature under which they are formed fall several degrees; or, remove a plant from its native spot and cultivate it in the rich soil of a garden for several generations, thus submitting it to the effect of what may be called domestication. Under such circumstances, an alteration will be produced in the structure of the plant, which will become manifest by external characters. This is what is called irregular metamorphosis, and may be considered the cause of the endless varieties of form into which garden plants are continually sporting. In a wild state, the varieties are comparatively rare; while, on the contrary, new forms, misnamed species, are always starting up in every botanic garden. In the garden of Berlin, Link states, that *Ziziphora dasyantha*, after many years, changed to another form, which might be called *Z. intermedia*.

But although there is no reasonable doubt that irregular metamorphosis does take place in consequence of some change in the conditions under which plants are formed, the *cosmica momenta* of some writers, yet it is certain that we are entirely ignorant of the specific causes by which metamorphoses are effected. We know that the cellular tissue, and the secreted matter or proper juices, are what chiefly manifest their sensibility of change; but beyond this, we know absolutely nothing whatever. In this want of information, the simplest manner of treating this subject is to take the parts of vegetation in succession, and to state what is known of the irregular metamorphosis of each.

The roots and tubers undergo a vast variety of changes; some of which are the effects of domestication, and others produced in wild individuals. Some grasses, when growing in situations more dry than those to which they have been accustomed, acquire bulbs, as if laying by reservoirs of nourishment to meet the casual want of a sufficient supply of food. Other roots sport, when domesticated, into various forms and colours, as is familiarly exemplified in all those which supply our tables. In the turnip the form varies from spherical to depressed,

oblong, or fusiform ; the epidermis from white to yellow, purple, and green. The celery, the root of which is fibrous when wild, produces, under domestication, a fleshy round root like a turnip, known in gardens by the name of *celeriac*. The common potato, the colour of which is usually yellow, produces a variety deeply stained, not on the skin only, but through its whole substance, with purple. The parsnep varies from fusiform to spherical ; and there are hundreds of instances of the same kind, of which everybody must be aware.

Metamorphosis of the stem is much less frequent than that of the root. The stems of the common cabbage are naturally hard and stringy ; but in a variety, called by the French, *Chou moellier*, the stem is succulent and fusiform ; and in the Kohl Rabi it forms a succulent tumour above the ground, in form and size resembling a turnip. In alpine situations the stem becomes shortened in proportion to the elevation at which it is produced, but it lengthens in low humid situations. Domestication has rendered tall stems more dwarf, and dwarf stems taller ; the common dahlia, the mean height of which may be estimated at six feet, has been reduced by cultivation to a stature not exceeding three. Cabbage and many other culinary plants have undergone a similar change ; while the common hemp has sported into a gigantic variety twice the usual size. The stems occasionally become bundled, that is, take the appearance of a number of separate stems connected together, side by side, as in the common cock's-comb, *Celosia*. This was formerly believed to arise from the union of several stems ; a manifest error, as an inspection of a dissected stem will prove ; it is an extremely irregular formation, somewhat analogous to that which constantly obtains in *Bauhinia*.

The leaves undergo a thousand metamorphoses, of which a few only need be noticed. They become succulent and turn inwards, forming what gardeners call a heart, as in the cabbage and lettuce. Their parenchyma extends more rapidly than the veins and margins ; this produces puckering, as in curled leaves. If the parenchyma and margin are together produced in excess, we then have what gardeners call a curl, as in the plants known by the respective names of curled greens, curled cress, curled endive, &c. If this tendency to parenchymatous development proceed much further, the surface is not merely puckered, but processes arise from it like small leaves. Scotch kale is an instance of this. Occasionally in compound leaves an unusual number of leaflets is produced, as seven instead of three ; a double pinnate leaf in some roses in lieu of a simple pinnate one. In other plants the reverse occurs ; there is a dahlia which constantly produces simple leaves in room of compound ones.

In flowers irregular metamorphoses are extremely common: they consist of a multiplicity of the petals, of a transformation of the petals into stamens, and a change in colour or in scent. In roses the multiplication of petals is the nearly universal cause of the double state of these flowers; in the rose *œillet* and many anemones, implection depends upon the conversion of petals into stamens.

With regard to colour, its infinite changes and metamorphoses in almost every cultivated flower can be compared to nothing but the alterations caused in the plumage of birds or the hair of animals by domestication. No cause has ever been assigned for these phenomena, neither has any attempt been made to determine the cause in plants.

We are, however, in possession of the knowledge of some of the laws under which change of colour is effected. A blue flower will change to white or red, but not to bright yellow; a bright yellow flower will become white or red, but never blue. Thus the hyacinth, of which the primitive colour is blue, produces abundance of white and red varieties, but nothing that can be compared to bright yellow; the yellow hyacinths, so called, being a sort of pale yellow ochre colour, verging to green. Again, the *ranunculus*, which is originally of an intense yellow, sports into scarlet, red, purple, and almost any colour but blue. White flowers which have a tendency to produce red will never sport to blue, although they will to yellow; the rose, for example, and *chrysanthemums*. It is also probable that white flowers with a tendency to produce blue will not vary to yellow.

Scent varies in degree rather than in nature; some plants which are but slightly perfumed, as the common China rose, acquire a powerful fragrance when converted to the variety called the sweet-scented; but there is no decided difference of scent among varieties of the same species.

Metamorphoses of fruit are very common, and administer largely to the wants of mankind. They consist of alteration in colour, size, flavour, scent, and structure. The wild blue sloe of our hedges has, in the course of ages, by successive domestication, been converted into the purple, white, and yellow plums of our desserts. The wild crab is the original from which have sprung the many coloured and excellent varieties of apple; some of which are scentless, others scented like the pine-apple and rose. In peas the parchment-like lining of the pod occasionally disappears, and the whole substance of the seed-vessel consists of lax succulent membrane.

Having thus passed in review the irregular metamorphoses of plants through all the different parts, there still remains a subject on which it is requisite to say a few words. This is the permanency of such

metamorphoses, or their capability of being perpetuated by seeds. It is a general law of nature that seeds will perpetuate a species but not a variety; and this is no doubt true, if rightly considered: and yet it may be urged, if this be so, how have the varieties, well known to gardeners and agriculturists, for many years been unceasingly carried on from generation to generation without change? The long red, and round white radishes of the markets, for instance, have been known from time immemorial in the same state in which they now exist. The answer is this: a species will perpetuate itself from seed for ever under any circumstances, and left to the simple aid of nature; but accidental varieties cannot be so perpetuated; if suffered to become wild, they very soon revert to the form from which they originally sprung. It is necessary that they be cultivated with the utmost care; that seed should be saved from those individuals only in which the marks of the variety are most distinctly conspicuous; and all plants that indicate any tendency to throw off their peculiar characteristics should be rejected. If this be carefully done, the existence of any variety of annual or perennial plant may undoubtedly be prolonged through many generations; but in woody plants this scarcely happens, it being a rare occurrence to find any variety of tree or shrub producing its like when increased by seed.—*Lindley's Introd. to Botany.*

OF THE SMALLER SPECIES OF ALGÆ OR FLAGS.—The slimy matter often seen on rocks and stones, on hard gravel walks, and on damp walls and cellars, or on the glass of windows, garden pots, and so forth, and which is often so minute as to be lost to ordinary vision, consists of curious and most admirable vegetable structures. All the green pulverulent coating, seen on old trees and palings, is also found, by microscopic observations, to be composed of an infinite number of small plants, of an exceedingly primitive formation.

The slimy masses, known as Will-o'-the-Wisps, or *Nostocs*, are instances of other allied species, some of which are called by country people "flowers of heaven;" a name which they deserve more than many that are often given to plants, if it be true, as the old herbalists declare, that "infused in brandy, they cause a disgust to that liquor in those who drink of it:" for, as Johnstone adds, they would then become "an excellent remedy for the *potatores summi*."

Not one of the least curious of the lowly flags, is the "red snow," which excited so much attention on Capt. Ross's return from the North Pole, in 1819. This phenomenon seems in some cases to depend upon the sudden appearance of a very minute plant, which the microscope shows to consist of small cells, filled with a red fluid, and which is referred to a genus named, from its very simple structure, *Proto-coccus*.

This plant, as well as the *Palmella cruenta*, or gory-dew, *Lepraria kermesina*, or bloody rain, with many others called reeks, or earth-sweats, as well as certain minute *animalculæ*, will sometimes suddenly appear in such great abundance, as even to tinge pools of water with the hue of blood, to make red stains on the sea shore, and to discolour considerable tracts of ground, so as to simulate red snow, or dew, or rain; and such in fact the appearance is vulgarly supposed to be. These occurrences are often regarded by the ignorant as of sinister omen; indeed whole towns have been occasionally alarmed with the report, that, in the course of a single night, the water of their pools had become changed to blood; and the dismay was not relieved until a philosopher exhibited to the eyes of many, the minute corpuscles which had wrought the change of hue, and which were easily separable by filtering the fluid.

Palmella cruenta, or gory dew, is common in many places; I found it abundantly, during 1831 and 1832, at Oxford; and it is frequently observed in damp situations, forming broad indeterminate patches, of a deep rich purple, with a shining surface, as if blood or red wine had been poured over the stone or ground. During dry weather it contracts, grows dull, and disappears: but after rain spreads anew, resumes its sanguine colour, and becomes conspicuous even to the most incurious eye. Its history affords (says Johnson) an easy explanation of a phenomenon considered supernatural by monkish chroniclers, and to which Drayton, in his notes to Poly-Olbion, refers. "In the plain near Hastings, where the Norman William, after his victory, found King Harold slain, he built Battle Abbey, which at last grew to a populous town. Thereabout is a place, which, after rain, always looks red, which some have attributed to a very bloody sweat of the earth, as crying to heaven for revenge of so great a slaughter."

But not only have we, at times, showers of the so-called red or bloody snow, rain, &c., and gory dew, ice, and so forth, produced as above explained, but occasionally these storms and dews are found of different colours, as green, blue, and yellow. These analogous phenomena are owing to plants not very different in their nature: the blue to *Byssus cobaltiginea*, the green to *Palmella botryoides*, and the yellow to *Lepraria candelaris*, or *chlorina*.

Besides the gory dew, *Palmella cruenta*, which is similar in its structure to the red snow plant, other low vegetable productions have been noticed by different authors, as possessing a similar colour: such are the *Lepraria kermesina*, which, by the way, is considered only a particular state of the red snow plant itself, and the *Byssus cobaltiginea*. These are always found in situations in which they are exposed

to the intense action of light, such as vast plains of snow, or masses of glittering limestone: whence it is inferred, that the colour of the red snow is attributable to the action of light, modified in some mysterious manner by the nature of the body on which it strikes; in confirmation of which hypothesis, it is remarked, that, when *Lepraria kermesina* is found under the stems of trees, stones, or in the crevices of rocks, where light can scarcely gain admittance, its colour gradually passes from red to green.

These simple plants, some of which constitute the so-called red snow and hail, and rain, and dew, and others which consist of one or several cellules, distinct or coadnate, give way to more advanced and regular structures in the *Confervinae* or *Boneworts*; and these again to the higher grades immediately contingent, known familiarly as sea-weeds, lavars, or kelp-ware.—*Bur. Bot.*

The above is extracted from the first lecture on botany, delivered at the King's College by the late Professor Burnett, and, with the rest of the course, recently published. As a teacher of the science of botany, the late Professor adopted that of synthesis. "Such a demonstration begins with the simplest plants; with those which have the fewest and simplest parts; with vegetables consisting sometimes of only a single organ, and thence gradually proceeds to develop their combinations in the more complex structures, as each additional organ is added or involved; until at length the most elaborate organisms, which, considered by themselves, would seem intricate and obscure, are rendered clear and intelligible, from many of their intimate component parts having been previously examined in detail, and in their distinct and independent states."

Other teachers pursue an opposite course, beginning with the highest, and ending with the lowest grades of vegetation. By this plan, it is said, a knowledge of the science, or at least of plants, is sooner attained; because the first being more gross, and consequently more perceptible and tangible, are easier comprehended and stored in memory, than by studying, in the first place, mere atoms of vegetation which are wholly microscopic. There is something like plausible reasoning in this, but it is no better reasoning than is used by those who assert that a language may be learned without the drudgery of studying the rules of grammar: or, that a person may be an able botanist, without knowing one iota of either vegetable organography or physiology.

ACTON GARDENERS' SOCIETY, established on the 1st of October, 1832.—The objects of this Society are to improve its members in the scientific knowledge of gardening, by forming a library of useful books to be circulated among the members; by meetings at stated inter-

vals for mutual discussion, and reading papers on useful subjects, and by providing a collection of specimens for the inspection of the members.

RULES.

I. That a Treasurer, Secretary, and Librarian be chosen annually, to perform their office gratis.

II. That each member of this Society meet at the usual place of meeting, on the first Monday in every month, at seven o'clock in the evening, from the first Monday in October till the first Monday in April, and during the summer months at eight o'clock precisely.

III. That each member shall subscribe one shilling per month, and that all arrears be paid up at the first meeting after every quarter-day.

IV. That each member may propose a book, and if that book shall be approved of by the majority of the members, it shall be bought as soon as our funds will admit.

V. That the books shall be circulated among the members; and that every member shall send his book to the usual place of meeting, by half-past eight o'clock in the evening, on the first and third Monday in every month, or pay a fine of two-pence, and one penny per day for every day he detains a book over that time. The books shall be ready to be forwarded by nine o'clock.

VI. That all books purchased are to be the exclusive property of this Society, to form a library, which is to be under the care of the Librarian, the Treasurer, and Secretary for the time being.

VII. That if any member lose a book belonging to this Society, he shall pay the full value of it. That if any member damage a book, he shall pay such a fine as the majority of the members shall agree to; and that if any member lend a book belonging to this Society, to any person not a member of it, he shall forfeit two shillings.

VIII. That if any member create a quarrel, so as to disturb the harmony of the company, his conduct shall become the subject of consideration at the next meeting; and a majority of the members deciding on its impropriety, he shall pay two shillings and sixpence, or be expelled the Society.

IX. That if any member refuse to pay any of the before-mentioned fines, or shall attempt to evade any of the rules, he shall be immediately expelled the Society.

X. That all fines be paid within one month, and go to the general fund.

XI. That any person desirous of becoming a member of this Society, must be proposed by one member and seconded by another, at one of the regular meetings, the election to take place by ballot, at the next succeeding meeting; such person will then be admitted a member,

unless a majority of black balls appear against him. Any member so admitted shall pay two shillings and sixpence admission money.

XII. That this Society shall never be dissolved so long as three members remain.

Treasurer, Mr. CLEWS.

Secretary, Mr. STAPLETON.

Librarian, Mr. JAMES.

Admitted a member

18

Secretary.

NOTICES OF BOTANICAL PUBLICATIONS.

EDWARDS'S BOTANICAL REGISTER, continued by Dr. Lindley. The February number contains:—

1. *Oenothera humifusa*. Pencilled Evening Primrose. "A pretty little hardy annual, creeping close to the ground, forming a plant a foot in diameter, and shedding its seeds very freely." It is said to be a native of America, and first described by Nuttall. It is the *O. concinna* of Don, and the *Boisduvalia concinna* of Spach in *Ann. des Sci.*

It appears that this last-named author has been lately employed in revising the genus *Oenothera* by cutting it up into four, five, or more new genera, quite unnecessarily; and for which he has received a most severe lecturing from Dr. Lindley. "Upon what grounds," says the Doctor, "it will be asked, is all this change effected? Why, upon this: Mr. Spach has made the prodigious discovery that in some species of *Oenothera* the seeds have a thicker skin than in others, that their skin is even occasionally pitted: he has further ascertained that the seed vessel is not always of the same shape, but that it is narrow in some and broad in others, tough in some and tender in others, now broadest at one end, now at the other; and he has even found out that some *Oenotheras* have eight ribs, others twelve, and others only four in their capsules!" Dr. L. continues, "Can anything be well imagined more perfectly absurd, or more pregnant with mischief than such doings as this? If there be any meaning in the word genus, and if it has any intelligible application, it must be the representation of some special simple type of organisation which differs from all other types: just as an order is the representation of some more compound type of organisation. . . . If the example of writers like Mr. Spach were to be followed, systematic botany would be resolved into its original elements: books would consist of mere masses of species; all power of analysis would be at an end, and the great objects of classification would be annihilated.

"A proneness to disturb existing nomenclature is very commonly alleged against modern botanists in a mass, and is looked upon by the public, who are much inconvenienced by it, as a besetting sin in modern natural history. That there is a good deal of prejudice, misconception, and no small degree of ignorance in this popular outcry, I, or any botanist, could easily prove; for it is impossible that, in a science of observation, the ideas of any man should remain fixed and immovable. As new objects are discovered the necessity of new systematic combinations become evident, and the ideas of botanists change accordingly, the visible result of which is occasional changes in nomenclature. Genera are thus materially affected from time to time, and new species as they are discovered render the creation of new genera necessary, into which some of the species of the old genera are very often transferred." We have quoted thus far merely to show Dr. Lindley's opinion of unscientific intermeddling, and also to show how far changes of nomenclature (so much complained of by the public) are justifiable.

2. *Oncidium Russellianum*. The Duke of Bedford's *Oncidium*. This is a very beautiful orchideous plant, introduced from Rio Janeiro by the Hon. Capt. J. Roos, R. N., who presented it to the Duke of Bedford, in whose stove at Woburn it has lately flowered.

3. *Bartonia aurea*. Golden-flowered *Bartonia*. A very beautiful half-hardy annual, discovered by Mr. Douglas in California, and raised in the garden of the Horticultural Society, where it flowered in July last. The plant belongs to the natural order *Loasaceæ*, but only flowers in perfection under very bright sunshine.

4. *Sarcochilus falcatus*. Falcate, or sickle-leaved *Sarcochilus*. A small but handsome flowering orchideous plant from New Holland, first described by Dr. Brown, and drawn from specimens which flowered in the stoves of Mr. Bateman and Messrs. Loddiges. It is said to be a rare plant.

5. *Brunonia australis*. Southern *Brunonia*. A most interesting new perennial, introduced by Mr. James Backhouse in 1834. The drawing was made from specimens received from Mr. Lowe of Clapton, and the Messrs. Backhouses of York. In appearance it is very like our wild *Scabiouses*, but is delightfully fragrant. It may require the protection of a frame in winter.

6. *Celosia coccinea*. Scarlet Cockscomb. A new species or variety of the *C. cristata*, from Asia. Its head of flowers is a short cone, very brilliant, and much harder than the common cockscomb.

7. *Cooperia Drummondii*. Drummond's *Cooperia*. "This is a very singular little bulb, and was discovered in the province of Texas, in North America, by poor Drummond, whose early death is deplored by all who feel interested in bringing to light the unexplored riches of

the vegetable creation." This plant has been described by the Hon. and Rev. W. Herbert, who has named it *Cooperia* in compliment to Mr. Cooper, gardener to Earl Fitzwilliam at Wentworth House, a practical botanist and cultivator of the very first rank.

8. *Kageneckia cratagifolia*. Cratægus-leaved Kageneckia. A very pretty half-hardy evergreen shrub, native of Chili, and flowering in this country in June. Hitherto it has been treated as a greenhouse plant, but it is supposed hardy enough to bear our winters if placed against a south wall. It belongs to the natural order *Rosaceæ*.

SWEET'S BRITISH FLOWER GARDEN. Continued by D. Don, Esq., Professor of Botany, King's College, London. The number for February contains :—

1. *Iris spuria*. Late-flowering Blue Iris. A species long cultivated in England, but seldom met with except in botanical collections, though few of the genus are more deserving a place in every flower-garden. It was considered a hybrid by Linnaeus, who therefore called it *spuria*.

2. *Adesmia pendula*. Pendulous-fruited Adesmia. A curious creeping perennial herb, native of dry sandy pastures in the province of Buenos Ayres, raised from seeds transmitted by Mr. Tweedie by Dr. Neill of Edinburgh. It has flowered in the Chelsea Botanic garden, and borne seeds freely.

3. *Saracha viscosa*. Clammy Saracha. A shrubby plant belonging to *Solaneæ*, raised in the Chelsea garden from seed received from Berlin by Mr. Anderson. It flowered and ripened fruit in the open border. It is nearly related to *Solanum*, and requires the protection of a greenhouse in winter.

4. *Lycium Afrum*. African Box Thorn. An erect, much branched, rigid, thorny shrub, bearing during summer a profusion of rich purple tubular flowers, without other protection than the face of a west wall. It also ripens seeds.

PAXTON'S MAGAZINE OF BOTANY for February contains :—

1. *Solanum crispum*. Curled Nightshade. A rough-looking plant, but bearing fine tresses of showy flowers. It is nearly hardy, and looks best trained to a wall.

2. *Aristolochia trilobata*. Three-lobed Birthwort. This, like the rest of its congeners, is a climber, bearing large purple fantastic-shaped flowers, emitting a disagreeable scent. The flowers are fugitive, but there is a long succession of them.

3. *Poinciana pulcherrima*. Beautiful Flower-fence. One of the finest stove plants, and deserves a place in every collection. It is one of the most elegant ornaments of Indian gardens, and, if cultivated in the best style,—that is, allowed plenty of pot and house-room and high temperature,—flowers readily. It belongs to the natural order *Leguminosæ*.

4. *Oncidium divaricatum*. Divaricated *Oncidium*. A Brazilian orchis, producing a long dangling spike of purple and yellow flowers, issuing from under the round pseudo-bulbs which bear the leaves.

Besides the above plants, which are described and figured, this number contains some valuable botanical and practical assays on the following subjects:—Remarks on the *Viola tricolor*; on the Genus *Thubergia*, particularly of the *Alata*; on the Advantages of early Planting this Spring; Culture of the Genus *Papaver*; Culture of the *Hydrangea hortensis*; Culture of the *Trevirana coccinea* and *Mimulus cardinalis*; Culture of the Genus *Macuna*, or Cow-Itch; Culture of *Amaryllideæ*; and Observations on Propagation by Cuttings: all which practical matter renders the number one of the most valuable of the work.

SMITH'S FLORISTS' MAGAZINE for February contains:—

Madame Mermond and Helicon Hyacinths; *Camellia Japonica candidissima*; Anne Boleyn and Superb Pinks; *Gladiolis natalensis*, Natal Corn-flag, commonly called *G. Psittacinus*. This elegant work maintains its character for faithfulness of drawing and accuracy of colouring, and, moreover, has the advantage of not only containing the old, but also the new ideas on the art of floriculture.

BOTANICAL AND GARDENING NOTICES, viz.—

The exhibitions of the Horticultural Society of London are fixed for the 14th of May, the 11th of June, and the 9th of July next.

The *first* exhibition of the Sheffield Horticultural Society is to take place on the 4th of May; the *second* on the 25th of May; the *third* on the 22nd of June; the *fourth* on the 3rd of August; and the *fifth* on the Wednesday in the week after Doncaster Races. Reports of these and other exhibitions we shall endeavour to obtain, for the information of our readers.

The Hon. and Rev. W. Herbert is preparing for publication a revision of the Natural Order *Amaryllidæ*, a work much wanted, and eagerly expected by the botanical world.

Professor Lindley is engaged by Messrs. Ridgway to commence *Sertum Orchideum*; or "A selection of the most remarkable of the Tribe, in a manner worthy of their interest and beauty."

David Don, Esq., Librarian of the Linnæan Society of London, is appointed Professor of Botany in the King's College of London.

Professor Lindley is appointed Demonstrator, Examiner, and Librarian to the Apothecaries' Company of London.

Mr. Loudon, in the Gardener's Magazine, quoting from the Bristol Mirror, announces that a Zoological Garden is about to be formed in the vicinity of Bristol, which, in connection with the Botanic Garden lately laid out by Mr. Forrest, will make that city as attractive for rational amusement as it has so long been for its trade.

CALENDARIAL MEMORANDA FOR MARCH.

This is one of the busiest months of the year in every department of gardening. The seeds of many of the principal crops must now be committed to the earth, and every part of the garden should be put into trim order.

KITCHEN GARDEN.—The knowledge of the quantities of culinary crops sown in the preceding months serves to regulate the kinds and quantities now to be sown. If quantities of peas and beans commensurate to the demand have already been sown, similar quantities will now require to be put in to keep up the supply. And to secure such supply different varieties of the same kinds should be from time to time sown. If the same kinds of peas and beans are preferred, a sowing of the necessary quantity should be made every fortnight.

In sowings of these crops at this time of the year, they are sometimes put in with the view of having other crops interlined, an excellent plan when the ground is limited in extent. In this case, the first crops should be drilled at greater distances apart; say, for the stronger growing sorts of peas, four and a half or five feet; and for common beans four feet asunder. These crops are never augmented by being too close together in the rows; and putting them in at good distances adds to their fruitfulness, and leaves a good space for the introduction of double rows of savoy, cabbage, or broccoli in the summer.

If peas or beans have been raised in pots or boxes they may be safely transplanted before the end of the month; drills should be opened to receive them, and, being removed carefully, placed at proper distances in the drills, and immediately earthed up. The state of the weather will best determine when this work should be done, as well as indicate whether they may require a little water when planted, or need a slight covering afterward.

In sowing peas at this season, there is an old rule which may just be mentioned, viz.:—"to sow the next crop as soon as the previous one appears above ground." This holds good through the present month, and perhaps the first fortnight of the next; but after that time the increasing heat of the season renders sowing at longer intervals necessary. Former sowings, if advanced any height, so as to be shaken by the wind, should be carefully earthed up. Keen March winds are often hurtful to exposed crops of peas, by withering or breaking the slender stalks.

Cauliflower.—If the weather be inviting towards the end of the month, prepare the ground on which to put out the plants which have been under hand-glasses or in frames during winter. They require rich

ground, and spaces thirty inches from each other. The plants under handglasses must still have the advantage of them at night, only raised on brick-bats; and when warm rain falls they should be wholly exposed during the day. Seedlings sown last month, if fit to handle, should now be pricked out on a slight hot-bed: by this means of getting them forward they may give heads in August. If no spring plants have been raised, sow immediately either on a little heat or warm border.

Leeks.—If a seed-bed has not already been sown, let this be done forthwith.

*Savoy*s.—Sow a seed-bed about the end of the month to come in early in autumn.

Cabbage.—Sow seed-beds of all the different sorts to supply plants to be set out as soon as fit. Transplant more from the autumn sown beds, loosen the soil, and draw earth to the stems of the earliest crops.

Potatoes.—Towards the end of the month plant another piece of early dwarf, or ash-leaved kidneys on a light dry border.

Broccoli.—In the last week of the month sow small quantities of the early white, the dwarf sulphur-coloured, and the tall purple sorts for summer transplantings.

Turnip.—A first crop may be sown about the twentieth; if sown earlier they run to seed before they are sufficiently bulbed.

Celery for a full crop may be sown in the fourth week, on an open warm spot; and if any seed was sown on a hot-bed last month, the plants should be pricked out on another in this. Celeriac may also be sown at the same time.

Parsnep.—Sow a full crop early in the month, either in drills or broad-cast: and about the same time a full crop of carrot in the same manner. Both require deep light soil. Open situations also suit them best.

Onions.—This is the proper season for sowing the main crops. Onions like fresh ground—may be sown in drills or otherwise, but the seed should be well trodden in. Those sown in autumn may now be transplanted on a rich open spot of ground.

Continue to sow all sorts of salad plants, as radish of sorts, lettuce of ditto, nasturtiums, small salading, &c.; also pot-herbs. Sow basil, love-apples, and capsicums in pots or pans in a hotbed. Sow also another piece of spinach, and small beds of coriander and chervil, if required; also dill, fennel, borage, sorrel, &c., to be transplanted about the end of May.

Asparagus beds will require the spring dressing, by slightly forking over the beds, raking them smooth, and marking off the alleys by line, to receive rows of cauliflower, lettuce, or other crop. Asparagus seed

may also be sown at this time, to raise young plants for future use ; and if new plantations are required, now is the proper season.

Artichokes must now have their spring regulation, by levelling down and digging the ground among them, reducing the stools to a moderate number of the strongest shoots, and slipping off all redundant suckers, which may be used to form new plantations, which also may be done in this month.

When the general business of cropping is over, all unsightly coverings of litter used during winter should be removed, all vacant borders and pieces of ground digged and prepared for cropping, and the face of the garden put in order ; then, as a finish, the walks may be turned, and all set to rights for the summer.

Wall Trees.—The peach and nectarine trees which had their shoots loosened from the wall in the autumn, must now be pruned, and nailed again just before the flowers open. Our reasons for this procedure were given in November ; and there is, in most seasons, much advantage in keeping the flowering backwards at this time, when night frosts may still annoy. All other pruning not yet done, should be finished without delay.

FLOWER GARDEN.—This is a busy month in the flower garden. The whole surface must be got smooth and in order for sowing hardy annuals, and the tender sorts sown in hotbed heat, preparatory to getting them forward for planting in the open ground as soon as the season permits. Dahlia seed may be sown, and the old tubers should be now placed in leaf-mould on a mild hotbed, or in the back of a stove, to raise shoots of which young plants are made for flowering. All greenhouse plants which flower in the open borders in summer and autumn, should now be propagated by cuttings and slips, and placed on a little heat to forward them. To particularise every plant which may be so treated, would form a very long list ; and the flower gardener will not be confined to such sorts as are usually so treated, but to every other which he may deem suitable for the purpose. Many are more splendidly flowered in the open air than in the greenhouse. All the bed-flowers, particularly tulips, now require attention, lest they be damaged by hail-storms or frost. All potted flowers, as auriculas, carnations, pinks, &c., should receive their spring top-dressings and regulation. Successions of all sorts of flowering shrubs, bulbs, &c., may be placed in heat, and a full stock of everything provided for a full show in summer and autumn.

REMARKS ON THE WEATHER

SINCE our last, the weather in the neighbourhood of London has continued exceedingly variable, hardly two days and nights together remaining at the same temperature, or having the same character. Upon the whole, however, it has been rather favourable for gardening business than otherwise. Not so in the western, and probably the northern counties of the kingdom, which have been visited by heavy falls of snow, so that in some places the roads were almost impassable.

Hereabout we have had violent gales of wind from the north and eastward; the latter dammed up the river Thames, so that at high water all the lower parts of the banks were inundated, and much damage done in cellars and warehouses at the east end of the metropolis. These gales and high tides have been followed by sharp night frosts, which render coverings for everything in frames as necessary as they were in the depth of winter. There is one advantage of frosty weather at this period, which is, keeping in check the shoots and blossoms of fruit-trees, which might otherwise be prompted to come forth too soon, and so be in jeopardy from the night frost of April and May. All preparation should, during the next month, be made against night frosts, as well as against bright sunshine, which is equally destructive to tender blossoms against walls in early spring.

The season hitherto has been more winterly than we have had for several years past; and if severe frost be as useful for the destruction of insects as it is supposed to be, we may expect less annoyance from them during the ensuing summer than in past years; but it is exceedingly doubtful whether frost kills any insect, or the eggs of insects which are injurious in gardens.

February 24th, 1836.

Just as our present number was going to press, we received a copy of THE ANNUAL DAHLIA REGISTER for 1836, containing particulars of the introduction, mode of cultivation and management, &c. &c., with upwards of *Fifty highly-coloured Figures*, of dissimilar dahlias, consisting chiefly of very superior new flowers. By an AMATEUR. Wright's, Haymarket. We have only room at present to observe, that this is a most splendid undertaking.

ERRATA IN LAST NUMBER.

Page 64, eleventh line from top, for 1791 read 1792.

— 70, top line, dele the word *atmospheric*.

— 73, fifteenth line from top, for *general* read *genial*.

— 77, ninth line from bottom, the word *what* is misprinted.

PAXTON'S
HORTICULTURAL REGISTER,

APRIL, 1836.

HORTICULTURE.

THOUGHTS UPON THE CULTURE OF THE PINE-APPLE.

BY A YOUNG GARDENER.

I HAVE perused with great interest many papers and treatises upon the subject of this plant, and have been led to the conclusion that its cultivators, however successful they may be in practice, have not cleared up many doubts on the proper treatment of the pine during the winter, which suggest themselves to the mind of one who has observed the various theories and directions which are now afloat. Let any reflecting reader take up the volumes of the Gardener's Magazine, that great repository of horticultural communications during the last ten years, and turn to the several articles upon pine culture, including the direct opinions expressed by the conductor himself, and he will be surprised to see how very contradictory they are.

In the first volume, page 426, I find what may perhaps be pronounced the best and clearest article on the general culture, from the sucker to the fruiting plant, by Mr. Greenshields. The winter temperature of the earliest period is directed to be kept from fifty to sixty degrees, while in the second winter, when the plants are in the fruiting pots, its medium is from sixty to sixty-five degrees. The closing observation is the one, however, which requires the greatest attention, because it leads to the consideration of that most important question, Should all plants—*should the pine-apple in particular*—be brought to a state of rest at some period of its growth? "It may here be observed," says the writer, "that no pine-plant should be checked in its progress, for the

consequence of checking is always a premature and weak production of fruit."

Now it must not be forgotten that Mr. Knight, the President of the Horticultural Society, had distinctly said, that, as he did not wish his plants to grow during winter, he kept his stove cool, (forty-eight to fifty degrees,) and its atmosphere very dry; a treatment diametrically opposite to that which he gives in the growing seasons of spring and summer, when excessive heat (eighty to one hundred and ten degrees) is maintained by fire and sun, accompanied by a state of extraordinary moisture, amounting nearly to that of a vapour-bath.

The following note is added to Mr. Greenshields' paper, and immediately succeeding the passage quoted above, which, if not written by the conductor, had at least his sanction:—"This last observation deserves the particular attention of gardeners, as it applies not only to pines, but to the whole class or order of vegetables termed by botanists *Monocotyledones*."

Here, then, we perceive that a state of constant growth, without interruption or check; is insisted upon by the skilful pine-grower of Englefield-house, and sanctioned by the conductor of the Gardener's Magazine!

But (at page 242, vol. v.) we find the following passage, which occurs in the Notes and Reflections during a Tour in France:—"As the pine-apple is, or ought to be, kept in a *dormant state* during the winter, the diminution of light, in consequence of such a covering, would not be an insuperable disadvantage," &c. This remark accords with the following, from, I presume, the same pen (vol. vii. p. 540):—"As points of culture and management in hothouses, we have seen reason for recommending the application of the principle of giving all plants a winter, or period of rest once a year, at the time when they are, from habit or circumstances, in the most dormant state, instead of keeping them, pine-apples and bulbs more especially, continually growing. The best dormant season for pine-plants is during the three winter months, unless for such as are intended to come into fruit, or to ripen their fruit, at that season."

From these statements I am constrained to suppose that Mr. Loudon has observed facts which have led him to depart from his opinion, that the pine ought to be kept slowly growing at all times. Be this as it may, the practice of many gardeners stands opposed to the theory of giving rest to the pine; and, not to multiply quotations, I would refer, on this point solely, to the circumstantial article (in vol. ix. p. 303) on Cultivating the Pine-Apple, by Mr. T. Appleby, wherein we find a register of the temperature of the stoves for every day in the year:

the author also distinctly says, at page 305, "It is always an object with me to keep all the plants *slowly growing at all seasons of the year.*"

But on the other side, that of *torpidity and dormancy*, there is a notice on the culture of the pine-apple in the neighbourhood of Monza, in Italy, where it is said that the gardeners let the temperature of their stoves fall in the winter as low as one degree of Reaumur (thirty-four and a half degrees Fahrenheit, or to within two and a half degrees of the freezing point): no injury is thereby caused; and it is asserted that the writer saw the finest pines so produced.

After this introduction of my subject, I feel called upon to state a few facts, which may help to determine *the proper temperature* that ought to be maintained during the winter; and the subject of this interesting inquiry divides itself into two parts:—the first refers to the winter temperature of those plants which are commonly called nurse or succession pines; the second to that which ought to be maintained for plants in the *fruiting-pots*, intended to mature their fruit in May, June, and July.

1st. The suckers are potted early in autumn, and growing fast till the end of October; artificial heat will subsequently be required, and maintained to between fifty and sixty degrees by linings alone, if possible, in preference to fire. This gentle heat will be sufficient to keep the plants slowly growing during the winter. It is at this period that I humbly conceive all the force of the opinions expressed by Messrs. Greenshields and Appleby applies, inasmuch as any check the plants may receive by being thrown into the dormant state at this critical period, *from cold*, will, ten to one, lead to premature formation of the fruit, upon the first application of heat after the shift in February.

This remark affords me an opportunity to state a circumstance which has recently come under my own observation, and which is conclusive of the important fact, viz. that pines, whether they are able to support thirty-four and a half degrees, or not, without injury, or even with advantage, may be seriously injured by cold.

A small collection plunged in leaves, in a brick pit well glazed, with three good linings formed of leaves, was destroyed by the severe frost of Christmas. The linings suddenly became cold, and the weather was so extremely piercing, that, notwithstanding the lights were covered with double mats and close-fitting deal boards, several degrees of frost entered the pit, and the plants, upon examination, were found to be quite decayed at the collar.

A pit of fine successions, a few miles from here, protected by dung linings, and mats at top, covered deeply with litter, was so injured,

that scarcely one plant in six will live. The gardener is an able grower, but he could not prevent the suddenness of the attack. In conversing with him, he gave it as his decided opinion, that a pine-plant will bear and survive half a degree of frost, but no more ; that no injury will be done at thirty-four or thirty-five degrees, as to *health*; but that, to provide for the future welfare of plants, which, after the first shift, should grow with the utmost rapidity till they reach their fruiting-pots, fifty or fifty-five degrees ought to be supported throughout the months of November, December, and January of the first year.

2nd. Of the *winter temperature for fruiting-pines* I have offered my opinion, which, I believe, coincides with that of many skilful cultivators, that the pine, after the spring shift, ought to be carried through all the future stages of growth with the utmost rapidity, up to the time that they are in their fruiting-pots at the end of the second October (for I am here speaking of fruiting the plants in eighteen months). Then I venture to suggest that, during November and December, the temperature of the stove should never, with *sun*, reach higher than fifty degrees: the bed in which the pots are plunged will gradually decline, and it need not be renewed till the fruit is ripe. The plants will thus become quite dormant, but under a degree of cold which will not injure their texture; yet this dormancy will become a check fully sufficient, I imagine, to throw the plants into fruit, without exposing them to those severe changes of temperature which they are too frequently subjected to by those who induce fruit by drying the plants off, with a fire-heat of seventy or seventy-five degrees, in the very heart of the winter, and then suddenly saturating the soil of every pot with water. Surely this is departing widely from the treatment which is indicated by our climate, where every thing, indeed, as respects the management of plants under glass, is unnatural. If the pine is rendered quiescent in the torrid zone by drought, it is under the influence of a burning sun; but *here*, at Christmas, all is cold, severely frosty, or very wet, with a great want of light. Is it not, then, evident that *we* ought to check by cool treatment, since we cannot have light? and trust to *that first effort* which, under a gentle and gradual excitement by fire, or the light of the sun in spring, increases; which will cause an appearance of renewed growth that will precede the starting of the fruit. As the heat is raised, the moisture of the atmosphere of the pit should be increased, till at length, when the plants show fruit, (the first sign of which is an enlargement of the breadth just at the base of the leaves,) the heat and moisture can scarcely be applied in excess; the growth of the fruit will then be prodigiously rapid, much more,

I imagine, than if a temperature of sixty or seventy degrees had been maintained through the dark months of November and December.

The conclusion I arrive at is this, that during the first winter, and the whole period of the growth of the herb, no check ought ever to be permitted; but that, during the early part of the *second winter*, torpidity, brought on carefully by low temperature, is surely the safest means that can be resorted to, to promote large and well-grown fruit.

The extent of this communication may require apology; I hope it will be found in the importance of the inquiry; and if it be favourably received, I will venture to trespass on your pages again, on the subject of a method (which I have seen practised) of growing the pine so as to produce fine fruit in a few months after the separation of the suckers.

A. L. A. T.

ON THE SHRIVELLING OF GRAPES.

March 2nd, 1836.

SIR,—I am very glad to find that the disease in grapes, generally known by the terms “shrivelling,” or “shanking,” is apparently calling forth the attention of your readers, as I am sure the growers of that valuable fruit will look with great pleasure and interest upon anything calculated to throw light upon the cause of it, or the means of preventing it; and as information derived from experience is generally more valuable and practical than from theory, I take the liberty of troubling you with the result of my observations upon the subject.

It is a very common opinion that the disease is produced by inattention to giving air to the houses sufficiently early in the morning; and I have known instances in which a decided alteration for the better has been produced in the appearance of the vines by its being attended to, after the shrivelling has made its appearance; but the effects have never been such as to satisfy my mind upon the point, and I am much more inclined to think with Mr. Denyer upon the subject.

The great objection to the curvilinear iron-houses has always appeared to me to be the difficulty of admitting air in sufficient quantity; and, of course, if the want of air is the cause of the shrivelling in grapes, one would expect to find it more in such a house than in one of wood, where air is easily obtained to any extent; but this is not the result which my observation confirms.

I have two houses, each about forty feet long; one of them has a curvilinear iron roof, and the other is formed of wood, in the common

way ; and last summer having been very dry and hot, was certainly a strong test. In the iron house I had a very moderate crop in quantity, but the quality was very superior, and I had no appearance of shrivelling in the bunches ; but in the other house, although air was admitted night and day during the greater part of the summer, the crop, which was unusually large, was half destroyed by shrivelling, and very few of the berries on the bunches were well-flavoured.

I think these facts go very far to prove that the want of air is not the cause of the disease. But there is another circumstance which tends in favour of the common opinion—I mean, the fact that the disease is never found in the open air on walls ; at least, I never remember to have observed it.

In common with many of your readers, I beg, in conclusion, to say, that further remarks from Mr. Denyer cannot fail to be acceptable ; and I trust the subject will call out many more of your practical readers.

I am, Sir, your obedient servant,

R. G.

ON THE PRACTICABILITY OF RENOVATING OLD FRUIT-TREES BY CUTTING BACK AND RE-GRAFTING.

FRUIT-TREES in orchards and in gardens, whether trained as espaliers or on walls, are liable to become stunted, mossy, and unfruitful from old age. When in this state, they only encumber the ground, become unsightly, and moreover, if they do bear a few fruit, it is small and inferior in quality. When fruit-trees arrive at this feeble state, it becomes a question with the owner whether the whole should not be rooted out and replaced by young ones. It is very probable that the generality of gardeners would approve of this mode of renewing the collection ; for, by retrenching the borders, and adding a fresh supply of proper soil, and choosing a set of young healthy trees as successors to the old worn-out ones, the walls or espaliers would soon be again replenished, and but little time would be lost.

But, without dwelling on the great labour and expense consequent upon the renewal of the borders, replanting, &c., it might be worth while to inquire whether the same result might not be compassed in a much more convenient, and as certain a manner, by re-grafting the old trees, or by simply cutting back the old branches to induce the production of young shoots, which may be trained in the same manner as before.

We have seen both these schemes practised most extensively in old

gardens with the best success. In one case, nearly one hundred pear and apple trees, which had been planted about fifty years, and which were trained horizontally as espaliers, but had become irregular and unsightly, were ordered to be renewed by grafting. It was considered best that each tree should be done at twice—that is, one half of the branches in the first year, and the other half in the next. Each alternate branch was sawn off at about four inches from the stem, and grafted in the first year, and the intermediate branches were done in the same way in the second. This plan was adopted for two reasons; the first was, that the roots might not be too much checked by removing all the branches at once; and the second, that the garden should not be disfigured by ranks of branchless trunks for any considerable time; besides, the reserved branches yielded a fair sprinkling of superior fruit in the first year, while the first grafts were shooting vigorously between them, and began to bear a few fruit in the third year.

In the fourth and fifth years, the symmetry of the trees was restored, and the grafts proved much more prolific than either young shoots from the old stem, or those of young-planted trees would have been; indeed this is the principal advantage of double-grafting, as it invariably induces a greater prolificacy in the shortest time.

The manner in which the grafting was performed was the most simple of all, namely, “rind-grafting,” or grafting under the bark. The branch intended to receive the graft was first sawn off to the length already mentioned, the saw being directed obliquely, so that the upper side of the branch should jut out a little over the lower side, in order that the face of the wound made by the saw should be towards the earth. The graft was prepared by forming its lower part like a wedge, the lower side, however, being cut away only, so as to expose the pith and half the woody axis of the scion. The upper side of the same was left covered with its bark, only pared off along the edges, in order that the inner bark of both graft and stock might be placed in contact.

The graft being thus prepared, its place was got ready by first slitting the bark of the stock where the graft was to be inserted; and with a little instrument called a messenger, made of bone, and exactly of the form of the prepared graft, the bark on each side of the slit was raised at once by thrusting the messenger inward. Thus an opening was made for the reception of the scion, as soon as the messenger was withdrawn; and when thrust home, received a binding of matting, and, clayed immediately, the operation was finished.

This simple and easy method of grafting is expeditiously done, and seldom fails. The only care required is in the summer after the graft

has made shoots, to secure it against being blown out of its place by the wind. The best security is to tie a rod from the stump into which the graft is inserted, along the espalier stakes, and to which rod the leading shoot is kept trained as it lengthens during the summer.

Re-grafted trees never grow so strong, nor do the branches extend so far as at first ; but they are much more prolific : the natural vigour of the tree being subdued by double working, induces moderate growth and fruitfulness at the same time. Indeed, when the seasons are favourable at blooming time, and if insects can be kept off, more fruit are likely to set, than a tree of such moderate growth may be able to bring to perfection ; but this is a circumstance for which an easy remedy is found in a timely thinning of the crop.

The stems of the trees above alluded to were, at the time they were re-grafted, cleared completely of all their old scabrous bark, in order to relieve the stem of any constriction, and all the rugged, exfoliated parts which might form a harbour for insects and their eggs. This decortication is always salutary, whether trees be grafted or not.

Espalier trees are certainly renewable by grafting ; and, of course, wall-trees are equally so. We well remember an instance of several fine old crasanne, colmar, and St. Germain pear-trees being renovated by different means in the same garden, and about the same time. Some were cut back, and re-grafted in the way already described ; others were simply cut back, but not grafted, trusting to the young wood which would be produced to replenish the wall. Two others, very large colmar pears, on a south-east aspect, whose branches were trained out six or seven yards on each side of the butt, were effectually renewed by simply cutting smoothly off every old spur from the branches, leaving the latter, as the operator expressed himself, like "bare poles." Abundance of summer shoots was produced as usual, along the whole length of the branches ; of these a proper selection was made and laid in, the supernumeraries being displaced. The reserved shoots became bearers as soon as possible ; that is about the third year, and continued to be afterward very fruitful.

We had not the pleasure of seeing those trees after these different operations were performed ; but, being particularly interested in the anticipated results, had regular reports of their progress for six or seven years subsequently, and learned that all the schemes succeeded to the entire satisfaction of the manager.

If such or similar expedients answer in one place, they may certainly succeed in others ; and were such practice sufficiently known and executed, there need never be seen immense fruit-trees occupying a large surface of walling or espalier rails, yielding nothing but annual

growths of summer shoots, only to be cut away, with only an occasional sprinkling of fruit near the extremities of the branches. We seldom enter an old garden without seeing barren old trees crying aloud for such manipulation; particularly pear and cherry-trees, which might easily be brought into a bearing state by some one or other of the means above alluded to.

Some trained fruit-trees are liable to become naked of spurs, or bearing wood at bottom. This defect may be remedied, either by pruning back, or by inserting buds or grafts on the naked parts. Peach and nectarine-trees are sometimes liable to this inconvenient deformity; and they of all others are (as far as our own experience has gone) the most difficult to be made to break into young shoots from the bottom of naked branches. We know that it has been long ago advised to make an angular incision subtending to a point, whence a shoot is required to issue: indeed, we have tried this, but without success. Inserting buds into such old limbs seldom succeeds, because of the thickness of the bark, which makes the operation impracticable. But we have often had our doubts anent this difficulty; whether or not, we have gone the right way about the business; because we have no difficulty in budding a shoot or branch one, two, or three years old; but, if much older, the operation is imperfectly performed, by reason of the thickness of the bark, and to its much firmer attachment to the alburnum. If, therefore, the bark be made as *thin* as is necessary in the first place, there would be no difficulty in putting in a bud at the proper season. We would therefore advise to shave off all the outer layers of bark in one season, and put in the bud in the next.

It must be considered, however, that stone-fruit trees are impatient of wounds, if made at the wrong season. If such shaving off the bark were done when the sap is without motion—that is, in winter—and so deep that the sap-vessels of the inner layers of bark were lacerated, the sap at its rising would ooze out and be coagulated into gum, and thereby injure the vital membrane by stopping the healthful current. But if such disbarking were done in the summer, less damage would ensue; the inner layers would be soon healed, and left in good condition to receive a bud or buds in the following July or August.

We are sorry to add that we have never tried this scheme of budding an old branch of a peach or nectarine; but we have no doubt that it is practicable and well worth a trial; and as such we particularly recommend it to the attention of our readers, some of whom may be induced to give the scheme a fair trial, and thereby originate a new and useful expedient in the management of wall-fruit trees.

Heading down old trees in orchards is a good old custom. Large

standard cherries submit to this operation with the best effects. Apples and pears are also decapitated successfully, especially if the roots be sound and in a congenial soil. In the cider countries, re-grafting old trees is the business of even the common carpenters ; who with their hand-saw, and a knife of a peculiar make to prepare the cleft for the reception of the graft, will re-branch a polled tree in a very few minutes, receiving payment only for the grafts which take. By this method of renewing a tree, the labour of planting a young one, and expence of fencing it against cattle for several years, are dispensed with ; and that it is also a most convenient process for substituting a valuable and desirable sort for a worthless or inferior one, is sufficiently obvious.

Upon the whole we may observe, that notwithstanding the great advances which have already been made in the management of fruit-trees, there may yet be some things which, if known, are not enough practised ; or probably, there may be new discoveries yet to be found out. Many years ago, it was customary to raise apple-trees from cuttings ; and we knew a man who used to raise very fine peach-trees from layers. These practices are now laid aside, since the great advantages of grafting and budding have been so fully proved, in rendering trees at once more dwarfed in habit, and consequently more prolific.

Connected with this subject, we may mention an improvement of one kind of tree by grafting it on another. The jargonelle almost always grows too luxuriantly when confined as an espalier ; but if grafted on an autumn bergamot, its luxuriance is checked, and it then becomes a moderate grower, and at the same time a plentiful bearer, though the fruit are never so large.

ON THE DIFFERENT METHODS OF TRAINING FRUIT-TREES ROUND THE QUARTERS OF KITCHEN-GARDENS.

(Continued from page 85.)

In order that the hedge-like appearance of fruit-trees, trained as espaliers, might be obviated, and that they might receive every advantage of air and light and refreshing showers, it was deemed an improvement to allow each tree a sufficient space on a marginal border to assume its natural form of head and irregular disposition of branches, with this special proviso, that each tree should always be kept in a snug bush-like form, without interfering with each other, or without

allowing them to shade too much of the ground below, or give the garden a wild woodland look. This plan, besides being favourable to the natural growth of the trees, offered another advantage, namely, the chance of bearing greater crops of fruit from the more numerous branches, and more extended spray of the head.

This method of planting and treating fruit-trees has been neatly and successfully executed in many gardens, and during the first ten years of their growth really look very well ; and, while in bloom, or bending with fruit, are beautiful.

The dwarfest growing varieties of the different sorts should be chosen for this mode of training. We say training, because, although the trees be allowed to take their natural form of head, its regularity, as to thickness or thinness, and proper position of the branches, must be regulated by the pruner. Such shoots as have a tendency to grow out of bounds must be stopped ; and so must those which are not sufficiently furnished with spurs. Those which may grow across others must be brought into their right places by ties ; and the whole head be so thinned by pruning out, or thickened by cutting back, that a rotund and well-balanced head may be always maintained.

When the trees have arrived at the required height, say five or six feet, (for they should not grow higher,) and have got into a bearing habit, they may be easily kept in order and in good form ; but such trees are aspiring, and have a natural tendency to grow larger ; and, if not fruitful, this tendency to luxuriance is still further prompted by the necessity of keeping them in regular order by the knife. Such vigorous growth can only be checked by severe stopping and disbudding in the months of May and June ; or by lifting the tree, and replanting it in October, or by the old custom of "ringing." Speaking advisedly, and from long experience, we know that summer stopping and timely disbudding will check luxuriance ; but we know, [also, that this business is very often neglected at this busy season (May and June) of the year ; and as the best alternative, we know that ringing the stem close to the ground is the most effectual expedient which can be had recourse to in order to bring pear and apple trees into bearing as soon as possible.

Our own practice was as follows :—The trees, which had been twice headed down in the nursery, were planted in well prepared loamy soil, about fourteen inches deep, lying upon a hard gravelly bottom, at the distance of about seven feet from each other in the row. They were dwarfs, with clear stems of a foot high. The first shoots were pruned down to obtain a sufficient number of branches to rise all round, and at proper distances from each other ; and always with a view to the bush

form. In three years they had gained the desired figure ; and, in general, about four feet high. A few flower buds were formed on each tree ; and to accelerate this habit, the stems were all deprived of a ring of bark about two inches from the surface of the ground. This operation was done with a woodman's rasing-knife, which made an opening about the sixth part of an inch wide, and as deep as to remove a thin slice of the alburnum. This separation of the bark had the desired effect. The exertions of the roots were checked ; and, of course, the expansion of the head became at the same time moderate, which was favourable to the development of fruit-buds.

The wounds on most of the free-growing trees were nearly healed again at the end of the year ; those that were completely so, were reopened with the same tool in the following spring ; and one (a Dutch codlin) growing much stronger, and overtopping the rest, was treated much more severely, by having a ring, nearly half an inch wide, removed all round. The weaker-growing sorts, as the nonpareil and golden pippin, required no farther check for several years.

The effects of the ringing became more and more visible every succeeding year ; and the rasing-knife was used occasionally, as the quick healing, and consequent extra vigour of individual trees required it. The Dutch codlin, before alluded to, was, in the fifth year, the smallest tree in the row ; a proof that it had been handled too roughly ; a perfect re-union of the severed bark, not having taken place. But to recover the tree, a fillet of bark from another was neatly let in across the original wound, tied and clayed, and united the bark as before.

We have already said that trees trained in this way look extremely well during the first ten or twelve years ; and our reason is, that after that time the bottom spray is liable to die off, the strong growing trees become tumpy, naked at the bottom, and unsightly, and then require some such treatment as is mentioned in the preceding article.

Another way of training trees planted along walks, or round the compartments of a garden, is one borrowed from the French, and called by them the distaff form. In this method of training a central stem is carried upright, whence side branches diverge from bottom to top, the lower ones extending about three feet, more or less, from the stem ; and those higher up, shorter and shorter, gradually, so that the whole tree assumes a conical form. A rank of fruit-bearing cones are very ornamental, because the branches are confined to a drooping position, one falling over another, from top to bottom ; and thus, without shading each other, or depriving each other of full air. The hanging position of the branches induces fruitfulness ; and, if the whole system can be kept in a very moderate state of growth, the plan is good, as

well, as ornamental. This method of training is best adapted for pears; and it is said that the French gardeners excel in thus training them; our more humid climate is not so suitable, because the ranker growth of trees is ever counteracting the design of the trainer.

Another manner of training fruit-trees on narrow borders to stand singly, thereby breaking the uniformity of an espalier rail—and, although occupying but a small space, admits of branches being trained to any length without stopping—is also a fashion borrowed from the French, but which is only partially followed in this country. It is called the *bush form* by the French, though, in fact, it is more like a barrel with its hoops. A young dwarf tree is planted in the usual way; four, five, or six shoots are reserved for the future principal branches; and these, when a circle of stakes are driven into the ground about eighteen inches from the stem, are led out and trained spirally round on the outside of the stakes, year after year, as far as they will go. The stakes are about five feet high, and are kept in place by a hoop at top, to which they are nailed or tied.

Trees so trained are firmly defended against wind; and the branches being led in such a tortuous position are, if the season allows, generally prolific. This plan is, however, more fanciful than useful. It is neither so convenient as the common espalier, nor is it so elegant as the distaff form; and certainly not so natural as the common bush-form already described.

There are several other fanciful forms in which fruit-trees may be trained; the inventors wishing to make the trees ornamental as well as profitable. Hence the weeping-ash, or open-umbrella form, &c.

ON FORCING CUCUMBERS WITHOUT DUNG.

SIR,—In the second volume of the Horticultural Register, page 204, Mr. Joseph Harrison has given “a description of a pit for growing cucumbers *without dung* throughout the whole year.” And in a note it is stated that alterations were in progress, which, when completed, should be furnished to the public through “The Register.”

As I have always had great difficulty in procuring a sufficient quantity of stable manure for hot-beds, my attention is naturally drawn with some interest to any plans which may be suggested for obviating it; and, although it has been long delayed, I trust Mr. Harrison will yet favour your readers with an account of his improvements; and also the result of his extended experience in the use of the pit, which I am sure cannot fail of being interesting to very many of your readers, as it

is to the observations of men as extensively and practically engaged in horticulture as Mr. Harrison, that we must mainly look for practical improvement.

I am, Sir your obedient Servant, A. Z.

SIR,—I beg to trouble you with a description of a pit for cucumbers and melons, heated by hot water, which I have had in use for nearly four years with success ; and, as I rather think of erecting another, I should be obliged to you, or any of your readers, if they can suggest any improvements. The only objection to the plan which has suggested itself to me is the expense of the heating apparatus in the first instance.

The pit is about twenty feet long by six feet and a half wide, and has six lights. It is built of brick, nine inches thick below the ground, and four inches thick above it.

At one end of the pit, within the wall, is fixed a small boiler ; and from the surface of the water a four-inch pipe is carried just long enough to go through the back flue and brickwork ; and to this is attached a wrought-iron triangular pan or trough, three feet wide and one foot deep in the centre, and without any covering. From the opposite end of this pan (which extends nearly to the other end of the pit) a pipe is fixed, which returns along the bottom of the pit to the bottom of the boiler ; so that, in fact, the apparatus is nothing more than the common hot-water apparatus, with the pan I have described substituted for the upper pipe.

About six inches above the top of the pan, cast-iron rafters are laid across the pit, about one foot from each other ; upon these, small faggots are placed about one foot thick ; and on the faggots, grass sods with the turf downwards ; and upon these, the earth for the melons or cucumbers.

The quantity of water in the boiler and pan being very large in proportion to the heat required, of course it need not be raised to near the boiling point ; and it has the additional advantage of retaining its heat a long time.

When the earth in the bed is once sufficiently warmed, I generally have the fire lighted about five o'clock in the afternoon, and it requires no further attention after six, so that the consumption of fuel is very little indeed ; and I have several times watched the heat in the *bed* for three weeks together, and have ascertained by one of the self-regulating thermometers that, without trouble, the variation may be confined to about four or five degrees.

I am, Sir, your obedient servant, R. G.

P.S. If any of your readers wish for any further particulars, I shall be happy to communicate them.

LANDSCAPE GARDENING.

LETTER TEN.

DEAR SIR,—In my two or three preceding letters, I have engaged your attention with some details of the kitchen garden ; its disposition, together with some account of the routine of business pursued in it ; all circumstances which, though constituting the main business of the gardener, ought not to be unknown to the general designer of a place like this. An ostensible connection should bind every the smallest part with every other part, so that the useful should be so intimately blended with embellishment that all should conspire to form a harmonious whole.

That this has been steadily kept in view by the original designer of Fairfax Hall, I hope you begin to perceive from what I have already written ; and trust that this will be still farther evident when you learn what remains to be related.

I have now to give you, first, a general view of the park, and the manner in which it has been improved—that is, changed from its ancient agricultural face, to a rich and extensive expanse of lawn, ornamented by groves of stately trees, valuable woods, and coppice. An inconsiderable streamlet, formerly occupying a straight ditch under a hedge, is now expanded into a beautiful lake containing several acres, studded with three little islets, and occupying the lowest dip of a valley to the westward of the house. The hedges which chequered the opposite banks and gently swelling knolls of the surface into squares, more or less regular, have disappeared ; and the general face of the park is at once interestingly undulating, and beautifully smooth and verdant.

I have already stated that the higher parts of the brows and their sides, which slope towards the house, are generally planted ; and the winding dips between are only partially furnished with groups, or single trees, but without hiding their windings, or screening their actual depth or extent. Crowning the knolls with trees adds to their elevation, and, moreover, gives greater apparent depth to the little valleys between. The *tameness* of groups, or open groves of trees, standing on smooth turf, is often complained of by people of real taste as too prevalent in English parks ; and, indeed, has been, from an improper love of smoothness admitted as a kind of principle in modern landscape gardening. Hence the opprobrious names of “ *levellers and shavers*,” bestowed so unsparingly on the Brownists. To obviate this

defect, my friend here, or rather his predecessors, have formerly taken good care that such a fault should not generally prevail ; because in every plantation there is abundance of the native holly, hawthorn, and juniper, which adds greatly to the massive beauty and intricacy, as well of the interior as of the margins of the groups and woods. The thicker masses of wood are never entirely insulated, but appear to be connected by intermediate trees and shrubs, which creep out between.

Nor do the various plantations in this park fall under the ban of those same critics who have derided with so much severity the *Brownists'* notions of placing a round clump of firs or other trees on the top of every hill or little eminence ; and sometimes scattering them indiscriminately over the whole face of a large domain, with much greater regularity than good taste wishes to witness. The different masses of wood have been placed, as already noticed, with special reference to the views from the house, if within range of the eye ; and in the back grounds they have been arranged with reference to the green rides which traverse over the outskirts of the park, and to afford the best views of the surrounding country ; and with reference, also, to the nature and acclivity of the ground so occupied. On the confines of the park, as well as on some portions in the interior, are considerable breadths of coppice or underwood, through which the green rides are led. The underwoods are fenced from cattle, and are not only profitable, but indispensable appendages as a cover for game, and for furnishing a great variety of useful stuff for the farm, garden, and mansion-house.

The predominating sorts of timber trees in the park are oak, elm, and beech ; some magnificent specimens of all these are met with, and particularly in the neighbourhood of the house, both within and without the pleasure ground. Some of these stand singly, and some are grouped with consummate skill ; a skill which must have been exercised at a far distant date. But even if these specimens are only the remains of an ancient wood, which might have covered this spot, their preservation is highly creditable to the fine taste of the then proprietor. For it is those trees which, intermingling over-head, flank the principal vistas which lead the eye down into the lower grounds, and up the opposite brows of the park, thereby producing what landscape-painters are so much delighted to depict, viz. *a shady and strongly marked foreground, and a distant and luminous offscape.*

Among the other kinds of forest trees, the Spanish, or sweet chestnut is plentiful ; large masses of them are planted together. Single trees of the horse chestnut are also scattered about. The formal, and

sweet-scented lime is distributed near the house, either singly or in groups, and many American forest-trees, as oaks, for their bright autumnal tints; and maples and larch, for their fresh yellow verdure in the spring, are disposed in various tufts, where they are backed by foliage of a darker hue. Fir trees are but sparingly introduced; and such as stand in the park are at a distance from the house.

In my first letter I believe I told you that a valley, commencing a little way within the principal entrance into the park, descended, and, widening as it descended across the south front of the mansion, was lost in a larger valley, which descends nearly parallel to the west front. In the bottom of this last-mentioned hollow, a small rivulet stole along to the southward. Its source was on the high land to the northward of the house; and though never a very abundant stream, it was never altogether dry.

The idea of raising a dam across the valley where there was a ford and foot-bridge, at about half a mile below the house, and by that means obtain an expanse of water, was a very natural wish of a proprietor who had a painter's eye. The idea was carried into execution, and a most interesting feature of the place has been created. The dam is so concealed by trees and bushes, that its artificial character is completely hidden; and, though the excess of water be too inconsiderable to form a cascade of sufficient importance for full exposure, it may be heard gurgling away among some large and rough stones fixed in the lower face of the dam. The banks of the lake, as well in outline as in height, are very irregular, and well designed and executed. Little promontories here and there jut into the water; some are bluff-pointed, and planted with trees and shrubs; others die smoothly off into the water's edge. Alders, weeping-willows, and poplars, with reeds and other aquatic herbs, occupy in irregular tufts and masses the margin of the lake, and so naturally are these disposed, that no stranger would suspect that the whole is a work of art. Here are no "tame banks" to offend the fastidious eye; no parallel edges nor canal-like form to shock the feelings of the connoisseur of the gallery. The surrounding land all dips towards the water, except only at the south end, where the surplus steals away; and this lower part being rather thickly planted, the lake appears embosomed in surrounding slopes on all sides.

This is the character which all made pieces of water should bear; because, if their surface appears higher or even as high as any of the adjacent ground seen at the same time, its artificial character is at once proclaimed, and its natural beauty impaired. The middle of the lake is so deep that it is a perfect fence against cattle wading across;

yet there are several shallow shores on both sides, at which the cattle drink, and often in the summer months congregate under the shade of the overhanging trees, to cool their limbs, and escape from their tormentors, the gad-flies, and *Conops calcitrans*.

The management of water is one of the most difficult operations of a landscape gardener's profession. Brown's great work of lake-making at Blenheim, will transmit his name with honour to posterity; but many of his minor attempts, as well as those of his followers, are perfectly jejune and ridiculous. In some places, small natural pools have been drawn out to represent a *winding river*, passing before the drawing-room windows, with both extremities deeply hidden in evergreen shrubs; while the stillness, colour, and sluggish appearance of the water betrays at first view its stagnant character. At other places, these accidental ponds, or small brooks, are formed into a rectangular "*sheet of water*," or curved canal, with smooth and trimly cut edges, as vapid and bald as a field of snow. These doings are really childish; because whatever is done by a garden artist, should either be boldly acknowledged as a work of art, and executed accordingly; or, if nature is to be imitated, it should be on such a scale as not only to impose on a stranger, but to delight the eye, and satisfy the mind of the proprietor, whose taste and money have accomplished the work.

Besides the vivid reflections from the sky, and the deeper ones of the trees, and cattle, and figures on its banks, the lake is useful in other respects; as affording the pleasure of rowing, or sailing a handsome cutter, and the amusement of angling: nay, more; by putting in a draw-net occasionally, a fair haul of trout, jack, and tench, are caught to supply the cook; and what are not wanted are transferred to a lock-up stew, constructed at the head of the lake.

At the head of this piece of water, the scenery is pleasingly varied by a change of trees. The course of the rivulet above the lake, is down a narrow kind of dell having rather steep banks. The carriage road to the back entrance into the park, passes over a neat stone bridge of three arches, near the head of the lake, whence the latter is seen to great advantage. The banks, both above and for a little way below the bridge, are planted with Weymouth pines, which here grow luxuriantly, in consequence of their roots reaching the water, and ranging in the peat-earthly soil by the sides of the brook. A few fine weeping-willows skirt the pines, and hang partly over the water; and the bridge, viewed from any point below, appearing placed in a recess, looks extremely well, being so decidedly connected with that element which renders bridges at all necessary. A bridge without water is like a ship in the midst of a city! Sometimes, indeed, the crest of a bridge, or a

mast of a sailing vessel, may be admitted into ornamental scenery to mark the existence of water which cannot be seen ; but bridges on dry land, and masts and sails without hulls, are tricks which no person of taste should have recourse to.

Viaducts across a dry ravine are allowable, as an easy passage from bank to bank, as the one already described over the entrance into the court-yard (there erroneously called a bridge), but they are both in appearance, and for their use, very different from a bridge.

The lake is peopled with a family of swans, as well as several sorts of wild fowl, particularly in winter. Several sorts of foreign ducks have been tried, but the tyranny of the male swan soon drives them away. The swans breed every year. A bundle of straw is laid on one of the little islets, which the hen puts in order, and lays, sits, and hatches two or three pairs of cygnets in the season. Twelve months afterwards the parents drive away their young ; and it is a good plan to remove them quite, as the male bird is a most relentless persecutor, especially to those of his own sex. The fish, besides those already mentioned, are eels, roach, perch, dace, and miller's-thumbs, which afford a rich feast for the herons frequenting the spot.

Below the lake are very rich meadows on each side of the brook, extending to the outside of the park ; and the higher ground on each side is finely wooded. The right hand brow, which is most distant from the house, is covered with an extensive plantation of evergreen trees, chiefly firs, relieved in front by evergreen oak, larch, and a few deciduous trees, planted lower down on the hill, and which have a most striking effect as seen from the house in the leafing season.

The whole of the higher ground beyond the lake, as seen from the house, is also finely enriched by masses and groups of trees, from and beyond the summit down in some places to nearly the edge of the lake ; and all the way from the plantation of firs just mentioned, to other plantations of the same kind and character, surrounding the game-keeper's cottage at the back entrance gate. This last portion of the park is, however, quite out of sight from the house, by reason of the intervening woods.

Our next tour shall be round the green rides, which are quite extensive enough for a morning ride, either on horseback, or in the pony-chaise, which is kept for the purpose, and often used by the ladies of the family.

Your's truly,

A. B.

ENTOMOLOGY.

OF THE THRIP.

WE ended our notice of this insect by saying that it is of a pale greenish white colour, smaller and longer shaped, and more active than the aphid; and we are happy in being able to add, by the kindness of our friend Δ, a scientific description of this little insect.

ORDO HEMIPTERA, *Linné*, Fam. V. THRIPIDÆ, *Steph.*, Gen. 1, THRIPS, *Linné*. *Snout* secreted within the mouth; *antennæ*, the length of the thorax; *body*, linear; *abdomen*, inclining upwards; *wings*, four, straight, long, incumbent on the back, narrower than the body, slightly crossing.

A powerful microscope must have assisted the entomologist to write such a description, as the insect in question is but just visible to the naked eye. They live chiefly on the leaves of various hothouse plants, and occasionally on those of forced French-beans. They prefer the under side of the leaves; and their bites on the cuticle resemble those made by the *acarus**, and with similar effect upon the general health of the plants on which they prey; the leaves become pale and somewhat distorted, and drop sooner than if they were free from this annoyance. If they once establish themselves in a collection of stove plants they are not easily eradicated; and we have often noticed that they are most injurious to those plants which have the most delicate foliage; and particularly those having pinnated leaves, as *Tamarindus*, *Poinciana*, and the like; so that whatever means are taken to expel them, whether a strong suffocating effluvia, or an offensive wash, is equally destructive to the foliage as to the insect. An ammonious vapour, so destructive to many insects, is equally destructive to delicate vegetation.

Strong and long-continued fumigations of tobacco, frequent syringing with water, and steaming, we have seen tried in vain. But we have often thought that these intended remedies failed in consequence of the infested plants being kept in the bark bed while the insects were undergoing the ordeal; for it is very probable that many of them were among, or might leap down and hide in the bark until the noxious fumes or vapour have gone off. We are rather inclined to believe that this might be the case, from an instance which came to our

* "The red spider cannot exist a moment in an atmosphere where *sulphur* in a volatile state is suspended; and a very small quantity washed upon the flue where it is warm but not very hot suffices: for that substance must never be ignited."—*Salisbury Hort. Trans.* vol. i. 297.

knowledge of an orange house having been cleared of both red spider and thrips by a long-continued steaming from flues made excessively hot for the purpose. Here there was no bark bed, or other shelter for the insects to hide in, but the naked paved floor, and that nearly flooded with water, and in which they probably perished. The steaming was certainly intense for several hours, but it was effectual.

Were it possible to hit on some *glutinous wash* which would in the first place entangle and arrest the insects for a day or two, and being of innocuous quality when first applied, and scale off when dry, so that the stomata or pores of the leaves would not be too long closed—would be, one would imagine, a good remedy. Perhaps even simple gum-water, diluted to so thin a consistence as to be applied by a common syringe, might be effectual. It contains neither acrid nor pungent qualities to endanger the health of the plants; and if it be not liable to remain too long as a varnish upon the foliage, might answer well. It would certainly be a much more agreeable application than either tobacco or brimstone, in a collection of sweet plants or fruit-trees.

Soap-water we would consider another good application; and this not for its bitter quality derived from the alkali in its composition, but from the unctuous nature of the grease, which drying on the leaves, and also on the bodies of the insects, clogs their action, and disgusts, perhaps, their palates.

Lime-water, impregnated with sulphur and tobacco juice, is strongly recommended as a defence against the attack of insects, or as an effective means for their expulsion. This, however, is more adapted for trees in the open air, than for delicate plants under glass; but a weak mixture of these ingredients might be useful even in the stove. At any rate, all the above applications are worth a fair trial; for something very simple may at last be discovered to rid us of this insignificant plague. Our friend Δ advises attacking the insects in their earliest stage of existence; and it is with this view that we recommend glutinous applications as a means of preventing migration.

OF THE AMERICAN BLIGHT.—This *blight*, as it is called, has borne many different names since it was first noticed as so destructive to apple-trees in our orchards and gardens. It has been called the frothy insect, the mealy coccus, the mealy aphid, the woolly aphid (*A. lanigera*), the woolly coccus (*C. lanigera*), &c. But it seems to be settled by Leach, who makes it the second genus of his family APHIDÆ, under the name of ERIOSOMA, in allusion to its woolly ap-

pearance. The species so detrimental to apple-trees is the *ERIOSOMA MALI*, because of its predilection for all the varieties of the common crab, cultivated and uncultivated. These insects seat themselves along the under sides of the branches, and under any prominent part of the bark, and appear to live on the juices of the tree, by puncturing the cuticle, which soon becomes exfoliated, deformed, and unhealthy. The insects quickly spread themselves over the whole tree, and if not prevented, eventually kill it. We have seen in the eastern corner of Hertfordshire, crab-tree hedges entirely destroyed by the woolly aphid. The young are exceedingly minute, so much so that we are convinced they can penetrate along the sap vessels of the bark; for little nodules are formed, and covered with healthy bark at considerable distances from the parent's station; and on these being removed by the knife, the colonies are discovered forming a new abode, over which the bark bursts, and permits their irruption into the air, where they breed and assume their woolly habit, which seems to be a protection against rain.

Dr. Leach's description of the insect is:—*snout* bent under the breast; *antennæ* short and thread-shaped; *body* covered with a soft down or wool. This covering, however, is not firmly attached to their bodies, like hair or feathers, as it may be brushed off with the slightest touch; and one singular property is that of their juices or blood being coloured like cochineal, which indicates an alliance with the COCCIDÆ.

The usual remedy for clearing an infected tree is by first dislodging the insects by a stiff brush; paring off all the rough and dead bark, especially where they have fixed themselves, and painting the whole trunk and branches with a wash made of hot lime and water. This is certain death to all, both old and young; care being taken that every cleft and cranny be well filled with the lime. Any other unctuous application laid on with a hard brush would perhaps do equally well. Trees so doctored require looking to, lest any again make their appearance; which if they do the washing must be repeated.

Mr. Rogers, in his excellent work on fruit-trees, recommends anointing the trees with a wash composed of soft soap and warm soft water, applied with a painter's bush, which he always found effectual if applied with care. This wash must necessarily be exceedingly annoying to the insects, as preventing all their movements, even if it be not fatal to them at once.

It has been said that this insect was introduced into England by a (*soi-disant*) foreign nurseryman who lived in Sloane-street, Chelsea,

about 1790 ; but from its being plentiful on crab-trees, nearly in the centre of the kingdom a few years afterwards, it is likely to have been brought long before. The apple-trees at St. Helena, were, in 1794, quite eaten up by the *Eriosoma*. The same insect, or a species of it, attach themselves to the roots of stocks and worked apple-trees in public nurseries ; and there do extensive damage if means be not employed to extirpate them. An insect of similar appearance and habits is often met with on the roots of dandelion, endive, and lettuce, and especially on those of old plants.

Another family of the gardener's pests, are the COCCIDÆ. Generic character : *Snout* only in the female ; *wings* in the male, but no wing cases ; female wingless.

1. Genus DORTHEZIA, *Bosc.* are scale bugs ; the body is covered by a number of cottony or waxy laminae, which partly cover each other, and are arranged usually in a triple series. In character and habit allied to *coccus*.

2. Genus COCCUS. These are also scale bugs, having a *snout* bent under the breast ; *antennae* thread-shaped ; abdomen of the male with two long bristles ; wings in the males two, erect ; females without wings.

These insects infest the pine-apple plant, occasionally peach-trees, and grape-vines ; orange-trees, and almost all hothouse and greenhouse plants, having firm and durable foliage. Sometimes one species of them is seen on the smooth bark of pear-trees, and on that of the black willow, and young ash-trees in woods.

(To be continued.)

MISCELLANEOUS INTELLIGENCE.

REMINISCENCES OF A VOYAGE TO AND FROM CHINA (*continued from page 103.*)—We left Pulo Penang, and proceeded eastwards toward Malacca. This passage, through a narrow sea, was most interesting. On the left hand, the kingdoms or principalities of Queda, Malayo, and, more in advance, Siam, were covered with luxuriant vegetation to the water's edge. To the right, the extensive and thinly-inhabited island of Sumatra was distinctly seen, and, like the opposite shore, was thickly covered with continuous jungle and lofty woods. The navigation was tedious, and the weather very unsettled : violent squalls and thunder-storms were succeeded by dead calms ; and as the ship met, or was carried out of the safe channel by various currents,

the kedge-anchor was often had recourse to, to keep her in due course. During this part of the voyage we had frequent opportunities of witnessing those awful phenomena, *water-spouts*. On one occasion, while passing two small islands, called by sailors the "*Rabbit and Coney*," five water-spouts were visible at the same time, all luckily at considerable distances, the nearest falling into the sea about five miles off. We thought from repeated observation, that those stupendous columns, which seemed to join heaven and earth, are easily accounted for. In a temperature of from 85° to 95° under a vertical sun, the exhalations raised from the sea, and especially from the wood-covered and damp surface of the adjacent lands, was most copious; surcharging the air with vast accumulations of clouds, all highly electrical. Here and there lightning descended, followed by torrents of rain; the surrounding heavily loaded air suddenly converged to the vacated space; contrary and impetuous currents were generated, which, impinging on each other in oblique directions, the strongest would necessarily involve, though partly opposed by each, all the others into a whirling motion. The grosser parts tending to the centre of the vortex, and coalescing, form the aqueous column which we see slowly descend. They are in fact the effect of partial tornados; if the tornado begin high and in the region of the clouds, the water spout descends; but if on the surface of the sea, the crests of the waves are caught up, and the column actually ascends. The spout is not solid, but hollow; and if they come athwart a ship, it is not so much the weight of water that is to be dreaded, as the violence and cross action of the wind.

The ship being frequently at anchor, we were indulged, when very near land, with the jolly-boat and rowers, to examine the trees which were impending over the water, (for we durst not go on shore,) many of which were most desirable and new to us. On one occasion we gathered large branches of the magnificent *Barringtonia Indica*, than which there cannot be a more ornamental plant, its large white flowers being conspicuous a mile off.

The Malaya shore appears to be very level: for a good way inland, and appears to consist chiefly of fine rich alluvial soil; and, were it cleared of wood and jungle, might be, by cultivation, one of the richest districts of India. By this clearance the climate would be improved, by rendering it drier, and consequently more healthy. Indigo, spices, rice, and sugar would be staple commodities; and it would appear that the last grows spontaneously here, because some of the miserable and ferocious-looking natives came along side in their rude canoes, calling out "*juggary ah*," which turned out to be small parcels of raw sugar wrapped in part of a plantain leaf, and bound on their heads to keep

it dry. This they bartered with the seamen for a ragged handkerchief or an old knife.

We arrived at Malacca on the 24th of October, 1793, a considerable town on the Malaya shore; it was then in possession of the Dutch, who had a pretty strong citadel, and a small body of troops. There is but very little ground, except the glacis of the fort, cleared, and therefore the woods near the town are very grand. We were on shore several days, and lived at a very respectable hotel, kept by a magnanimous Dutchman, whose steward spoke pretty good English. This man was our guide into the gardens and fruit and vegetable markets of the place; and we were delighted with every thing we saw, especially the fruits, many of which we had not hitherto seen. Luckily, we were at this place when many of the fruits were in perfection, and, at the same time, many of the plants in flower. Among the latter, the *Æschynomene grandiflora* is in every garden; the flowers are large, and disposed along the young shoots, from which they hang. They are perhaps the largest of all papilionaceous flowers; the standard projects over the other parts an inch and a half in length, and is of a fine purple colour; the wings pale pink, rather spear-shaped, and bending inwards; the keel large, and variegated with yellow, pink, and purple; stamens long, bent like the keel; anthers yellow; pods somewhat jointed. This fine plant shoots up very quickly, but never becomes a very large tree. Among many other trees seen in the environs of Malacca, the *Michelia champaca* is one of the most conspicuous; it grows to a large size, and was, at the time of our visit, profusely covered with yellow flowers. Besides the indigenous plants, some of the settlers have many others in their gardens from other parts of India and the South-Sea Islands. The bread-fruit was here in great perfection, but, in our estimation, not near so good to eat as their yams, (*Dioscorea*,) nor yet as a British frosted potato, the flavour of which it very much resembles. Their other fruits are, however, excellent; for, besides those mentioned as common at Madras, they have the incomparable Mangosteen (*Garcinia mangostana*) in great plenty. This fruit resembles a large pomegranate, having both calyx and star-shaped stigma persisting. The outside shell is of a dark purple colour, enclosing a delicious transparent pulp, surrounding the seeds. Besides the super-excellence of the fruit, the tree and foliage are beautiful. The growth is decussate, and forms a handsome middle-sized tree, of a bluntly conical outline.

We purchased four other sorts of fruit in the market, but did not see the plants which produced them, the sellers having brought them from

the interior of the country. The first is called by the natives *Dukoo*; an egg-shaped fruit, about the size of an apricot, of a pale peach colour. Interiorly it resembles the Mangosteen, but neither the calyx nor stigma is, like that, persisting. The flavour is very little inferior to the Mangosteen, and is by some palates even preferred. The second is called *Rambosteen* by the Dutch; it is small white fruit, having an outer rind, and pulp, and seeds like the Mangosteen, but grow together in bunches. The third is called *Baduc* by the natives, and *Jambosteen* by the Dutch. This fruit is of a rich crimson colour, much echinated, that is, covered with soft prickles, including a transparent pulp of good flavour, and a single flat seed. We supposed this to be the rose-apple (*Eugenia Jambo*, or *Malacensis*) of authors, this country being the region of *Eugenia* and its closely allied genera. The fourth is called *Courangi*, a small fruit, with a brittle shell enclosing a single seed, surrounded by a dry melting pulp, in flavour like a tamarind.

We could get no plants of the above, except a couple of Mangosteens; but we laid in a good stock of seeds of all, many of which remained sound through the greater part of the voyage home, as we tried them in pots in different latitudes; but seedlings are ill fitted for a sea voyage.

We left Malacca with our head and hands full of one thing or other, having a largish assortment of seeds, and specimens, and fruit in spirits, and soon after had a box of very promising seedlings, but which last all perished in the Chinese seas.

On the second or third day after leaving Malacca, we met with an incident which we must be excused alluding to. On doubling a headland about ten or fifteen miles to the westward of a dangerous rock in the Straits of Singapore, called *Petro Blanco* by the Portuguese navigators, and which the East India Company's commanders are not permitted by the rules of the service to pass *in the night*, we came suddenly upon a French frigate and her six or seven prizes, taking in water on the Malayan shore. The *Triton*, together with the other two ships under the command of Captain Price, of the *Royal Charlotte*, immediately gave chase. The Frenchman cut and run, recalling his watering party, who abandoned their casks and some of their boats in the utmost confusion. The frigate fled away towards the Straits of Sunda, and his prizes were soon overtaken; and, on firing a few guns at them, struck their colours, and were one after another taken possession of. The largest prize, a Dutch corvette of rather a formidable appearance, (and a match for any Indiaman single-handed,) which had been taken by the Frenchman the day before, after firing a few ill-

directed guns, struck her colours also. This was a bloodless affair ; and by this time the ships, being near *Petro Blanco*, came to anchor for the night. The next morning our prizes were given up to their respective owners : the French prize-masters and their men were distributed among the crews of the three Indiamen, and were carried as prisoners of war to China.

We had now entered the Chinese seas, just at the commencement of the *Tonfoon*, or stormy season. We were prepared for the worst, and before we had gained the middle of these seas we met a *Tonfoon* in earnest, when the ships parted company. For eight days the *Triton* lay-to under a mizen stay-sail, with topmast-yards and topmasts struck, the sea breaking over us every minute. When the weather moderated, we found ourselves on the west side of the Philippian Islands, and not far from Manilla. We then resumed our course towards Macoa, and arrived there one day before the *Royal Charlotte*, but one day later than the *Warley*, which ship we found at anchor in the mouth of Canton river.

The first view of the coast of China is certainly very prepossessing to a stranger ; the general face of the country is, as far as the eye can reach, an almost level tract of rich alluvial land, highly cultivated, and intersected by numerous canals, which answer the purpose of highways in the "celestial empire." But this level is beautifully diversified by a great number of conical hills which are scattered over the country, some of which are cultivated or covered with trees to the very top. Whether these peaks have been raised by volcanic action, or have been formed by the abrasion of a superincumbent sea, we cannot say ; but from the uniformity of their outline, and the character of their substance, it is evident that they have all been formed by the same agent.

We had an opportunity of going on shore a few miles up the river, to examine a picturesque-looking dell at the bottom of a hill, surrounded by lofty trees and shrubs. We found it to be an ancient quarry of granite, worked out with much ingenuity and labour, the whole face of the rock being cut into steps from the bottom to the top, so that blocks of any portable length and width could be had for the purpose of the builder without much trouble of chiselling into form. The trees were, *Laurus sassafras* and *L. camphora*, intermixed with *Olea fragrans* and many other low trees and shrubs, as the *Hydrangea*, *Clerodendrum*, &c. In another day we passed the second bar, and the *Bocca Tigris*, a Chinese fort on the left bank of the river, and soon after was moored at Whampoa, among a great number of ships of different

nations, (except French,) in which number were the *Lion* British ship of the line, and the *Hindustan* Indiaman, then recently returned from the Yellow Sea, where they had landed Lord Macartney and suite, and were waiting the return of the embassy over-land.

On the same afternoon we proceeded to Canton in a Chinese barge, along with the captain's establishment, and were safely lodged in the British *Hong*, where we constantly resided for three months.

Our first business was to deliver our letters of introduction; one was from Sir Joseph Banks to Dr. Duncan, Physician to the Company's supercargoes at Canton; and another from T. Evans, Esq., of Stepney, to — Arthur, Esq., the Company's Inspector of Teas at the same city. From these gentlemen we received much valuable advice, as well in regard of the plants we were in quest of, as of the means of procuring them, and the manner of dealing with the nurserymen.

We were advised to visit first of all the picture-shops. This was an excellent plan; for there we purchased a good many well-executed and faithful drawings of many of the plants we particularly wanted, and by them we were enabled to explain to *Samay* ("the old gardener," as he was called by the English residents) what we wanted. At first he brought a few true sorts, but mixed with a few false ones; the latter were instantly rejected. *Samay* was astonished, having never met with such a customer before; he even appeared careless about dealing with us afterwards; but when he was told that a few dollars were no object, he relented, and afterwards always brought what was wanted, or told us at once that such and such plants could not be had at Canton.

During the voyage out, we had accurate dimensions of the vacant places about the ship in which boxes of plants might safely stand; and calculating their capacity as to the numbers they would contain, we had only to make a selection of the most valuable for transportation. Giving orders for the construction of the boxes, procuring cane baskets to shift the plants into, and preparing a compost for them, were the first of our proceedings at Canton.

We had with us a copy of Kœmpfer's *Amœnitates Exoticæ*, as well as Thunberg's Illustrations of Kœmpfer's Japanese and Chinese Provincial Names of Plants; but though we got some of the plants by the figures given of them by those authors, the attached characters were of no use, the most learned of the Chinese declaring that the characters were "*old men's writing*." We were often beset by seedsmen, who offered us boxes of many different sorts of seed put up among rice-meal, neatly folded in showy yellow paper, and superscribed with fine

characters. Their charge was one dollar per box, for rubbish not worth one farthing, consisting of rape, radish, amaranthus, &c., and which these *regular traders* had had by them perhaps for many previous years. Our despising such bargains, and exposing such impositions, we hope ruined the trade of those panders to the gullibility of Europeans.

We were very much confined in our perambulations about Canton, by the systematic jealousy of the Chinese authorities. We saw none of their nurseries; but, by special favour of some of the Security Merchants, we were, in company with themselves, allowed to visit some of their finest gardens;—that of *Monqua*, in the southern suburb, and the large garden and palace of *Shykinqua*, on the north side of the river. The latter was almost a public resort for Europeans while we were there, as it was getting ready for the reception of Lord Macartney and suite, as his residence while at Canton.

The style of Chinese gardening, like all their other arts, is peculiar; they have no idea of spacious landscape; there is a littleness in all their designs; they have a desire for a small part of every the grandest features of nature: lakes, where a mackarel would be puzzled to turn; rocks which a man may carry away under his arm; aged trees fifteen inches high; and thick forests of pines composed of equisetum. Of whatever extent the ground may be, it is all divided into little squares, parallelograms, or irregular areas of a few square yards or perches. These compartments are surrounded by low brick walls, having a flat coping, on which are placed flowering plants, in fine glazed porcelain pots. The paths are often composed of flat stones, not two of which are on the same level, if near together. A great deal of trellis-work are in the gardens, either appearing like the remains of former fences, or as coverings of naked walls. If a ditch or artificial hollow be in the garden, it must be crossed by a semi-circular arch of four or five feet span. Their little tanks of water are not considered beautiful until they are completely covered with ducks'-meat (*Lemna*); in short, there are so many childish freaks which constitute the beauty of a Chinese garden, that it is astonishing so clever and civilised a people can be gratified with such puerile efforts of unnatural taste. As far, however, as their collections of flowering plants decorate a garden, the assemblage is enchanting. Their Magnolias, Bombaces, Azaleas, Camellias, Ixoras, Pæonias, &c., not to mention the great variety of herbaceous and aquatic plants natural to the country, are indeed magnificent; indeed one of the finest traits of the Chinese character is their fondness for flowers.

(To be continued.)

REVIEWS.

The Annual Dahlia Register for 1836, containing particulars of the introduction of the Dahlia into this country; mode of cultivation, and management; the properties of a good flower; arrangement of stands for shows, show-flowers, &c.; and upwards of fifty highly coloured figures of dissimilar Dahlias, consisting chiefly of very superior new flowers, with catalogues of growers. Also specimens of several old flowers, with an alphabetical index of seven hundred varieties of the Dahlia; and an account of exhibitions held in England and Jersey in 1835. By an AMATEUR. H. and W. Wright, Haymarket.

THIS is, indeed, a splendid publication, and must have cost a considerable sum in getting up. To the lovers of this now extensively cultivated and fashionable flower, the book will be a great treat. Above fifty of the finest varieties are lithographed by Hullmandel, accurately drawn, and beautifully coloured; and as they are represented, the regularity of the petals is astonishingly exact, and more like the reflections in a kaleidoscope, than the regularity of nature. No doubt the figures are faithful, and the execution reflects very great credit on the artists employed, whoever they may be.

Nor are the pictures all; many very excellent rules for their cultivation are given in the shape of extracts from *Mantel's Floriculture*, and from the *Horticultural Journal*. In the preface the author states, "We have figured nothing in this work but what has passed our own hands, which were taken from blooms while in perfection, and may be relied on as true and correct specimens of the original flowers they represent. If the advantages we contemplate should be derived by our friends through the medium of this work, which we hope will be the case, we have in contemplation such arrangements for our next publication as, we have no doubt, will be more satisfactory to them, and of greater utility to the public."

Thus it appears that the present is only the first of a series with which we are to be treated. Undoubtedly, if the *dahlia rage* continues, and if cultivators continue to be as successful in raising new varieties, as they have been during these last seven years, there is ample room for a *Dahlia Annual*, and we wish the scheme every success.

Every public dahlia grower should have a copy, if for no other

purpose than having the figures to place in a glazed frame, for the inspection of customers ; and the private cultivator ought to have the book as a memorial of what has already appeared, and as a standard by which new ones may be judged of when they do appear.

The practical instructions are from *Mantel*, which states that "it has been computed not less than twenty thousand seedling dahlias are raised annually in this country. The facility with which they may be raised—the comparatively short period which intervenes between the time of sowing and that of flowering—and the great success which has hitherto attended this mode of propagation, will, no doubt, account for the extensive cultivation of this highly esteemed flower.

"The dahlia is also propagated by cuttings and by divisions of the crown ; and new and beautiful varieties are constantly raised from seed. The seed is usually obtained from the finest double flowers ; but some successful propagators prefer that procured from semi-double varieties ; and we believe some of our finest dahlias have been raised from semi-double seedlings. The seed should be collected early in the season, as soon as the blossoms have withered, and the receptacles are sufficiently dry.

"If desirable, the seed may be collected late in the season, and when the receptacles are in a green state, in which case they should be divided and placed in a window, or in any dry warm situation ; and if the seeds be allowed to remain in the calices, they will retain their vitality better than if detached from the receptacle.

"The seeds should be sown in large pans or pots about the middle of February, and placed in a hotbed frame. The young plants require to be potted off singly into the smallest sized pots, soon after the cotyledons are above ground, and when the first pair of leaves are sufficiently developed. They should then be placed in the frame nearly close to the glass, to prevent them from being drawn up weakly. When of sufficient size, they may be re-potted, placed in a cold frame, and protected at night till the middle of May, that being the period for planting them in the open air.

"Those who propagate extensively, sow the seed in hotbed frames the beginning of March ; and during the month of April, instead of potting, set out the seedlings on a slight hotbed, covering them at night with mats, until the planting-out season arrives. With the view of obtaining new varieties, some propagators transfer the pollen from one flower to another, by means of a camel-hair pencil ; in which

case, the flower intended to receive the pollen should be covered with a fine gauze bag, a day or two before the flowers expand; and the covering be continued a few days after the operation is performed, lest flies defeat the object of the cultivator. This mode is seldom practised, because mixing the plants in the common way answers very well.

“Cuttings may be made about the end of February, or beginning of March. The old roots should be placed in a lothouse, or hotbed, and the tubers covered with sand, or finely-sifted tanner's bark, leaving only the crown exposed. They will soon put forth shoots; these should be carefully detached when about two or three inches in length, and planted singly in small pots, filled with a compost of equal parts of well-decomposed leaf-mould, hotbed decayed dung, fine sand, and sifted garden mould; after the cuttings are inserted, they should be put into a mild hotbed, carefully shaded from the sun, and protected at night by mats. If, in applying linings of fresh dung to the bed, steam should enter, the plants will be liable to damp off, unless the lights be sufficiently raised to allow the steam to escape. In about a fortnight, or three weeks, the plants may be removed to a cold frame, and gradually enured to the open air.

“Where only a limited supply of strong plants is required, we have recently discovered that the finest plants are produced by detaching the young shoots when about two or three inches high, so as to include *the cluster of buds surrounding the base of each shoot*. Some care is necessary in this process; the shoot should be held near its base, by the finger and thumb; and by a slight motion of the hand to and fro, it will be detached from a kind of socket. If the operation be adroitly performed, the base of the shoot will present a convex surface, surrounded by a number of incipient buds; and a corresponding concavity will be found in the crown of the tuber, whence the shoot has been extracted. Plants raised by this mode not only produce the finest flowers, but the crowns invariably break the following spring; which is *not always* the case with plants raised from cuttings in the ordinary manner: it has been asserted that the cause of failure has, in many instances, arisen *from the removal of the incipient buds at the base of the leaves of that portion of the cutting which is usually inserted in the ground*.

“There can be no doubt, however, if the buds be removed, the cutting will readily strike root, producing luxuriant foliage, and a profusion of flowers. But although the new tubers are numerous, and fully formed, it will, on inspection, be found that they are merely attached to a

hollow stem, and consequently, the crown being absent, no buds can possibly be developed by any subsequent treatment. It is, therefore, important, if the perpetuation of the plant be required, that the buds be not removed."

Besides these rules for the propagation of the plant, very full directions are given for its subsequent management in planting out, staking, pruning, taking up the tubers, and storing, &c. &c., for which we must refer to the work itself. We cannot omit, however, giving one more extract relative to the comparative merits of a perfect flower. "The flower should be erect, and stand completely above the foliage; for if the peduncle be short, so that the flower be hidden among the leaves, it will not be displayed to advantage.

"Form, colour, and size, are considered the essential properties of a fine dahlia.

"1. *Form*.—All good judges allow that perfection in form consists in the near approach to a hemisphere. The Springfield Rival may be given as an instance of the nearest approximation to a perfect flower: it is, however, too flat in the centre, and the outer petals are reflected. It is essential that the outline should form a true circle, and consequently, the petals should be regularly disposed, rounded, smooth at the edges, or rose-leaved, and slightly concave, but not so much so as that the back of the petals should be seen in front. Those flowers, whose petals are narrow-pointed, notched, or fringed, as well as those that are flat, or convex—however desirable for the flower border—are objectionable as show-flowers; as are also those which, when fully blown, exhibit the eye or disk. In some dahlias the petals, near the centre, converge and conceal the disk, which when the flowers are fully expanded becomes exposed: these are, therefore, pronounced by florists imperfect flowers.

"2. *Colour*.—As regards colour much depends upon taste; but *selfs* (i. e. flowers of one colour) of whatever colour they may be, should be bright and distinct. In striped, spotted, tipped, or variegated varieties, the colours should be well defined, and every petal uniformly and distinctly marked. Those that are pounced, blotched, variously or irregularly marked, are inadmissible as show-flowers.

"3. *Size*.—When other properties are equal, size will determine the preference; but in judging of a good dahlia, form must have the pre-eminence, then colour, and lastly, size: but in no instance should either form or colour be sacrificed to size. The relative proportions of excellence in these criteria have thus been estimated: form three, colour two, size one."—These proportions have been fixed by the censors of the Metropolitan Florist's Society. In short, the book contains, we

venture to say, every thing necessary to be known respecting the dahlia, as well as where the best sorts may be purchased, together with the present prices.

A Summary of Practical Farming: with observations on the breeding and feeding of Sheep and Cattle; on Rents and Tithes; and on the present state of Agriculture. By C. Hillyard, Esq., President of the Northamptonshire Farming and Grazing Society. Dicey, Northampton; and Ridgway, London.

It has been said, that "a great book is a great evil." This charge certainly does not apply to the excellent little tract before us, as it contains only fifty-two small octavo pages. But small as it is, it embraces matters of the greatest national importance; all set forth, not only concisely, but in the clearest practical manner. It is not a book of gardening, but it is a book for all those gardeners whose duty it is to manage the farm, as well as the garden of their employers: and many have this task imposed on them, who never expected to have such matters to attend to; for this reason every young gardener should be acquainted with the contents of this little pamphlet.

The eminence of the author as an agriculturist, his feelings and ideas as a landlord, his intimate knowledge of the situation of British tenants, and of the claims and deserts of the British labourer, all qualified by the kindly feeling and patriotism of an English gentleman, stamp every thing he has advanced with more than ordinary value. The whole is a tissue of practical truths, embodying the pith and marrow of almost all that is known, or need be known, relative to the management of what is called a *turnip-land farm*.

We will only make one extract of the author's opinions, on a subject which at this time is generally interesting to all:—"Very low prices for agricultural produce will certainly be beneficial to some classes; but the question is, will such low prices, with our high taxation, be for *the general good*? I think not; for the lower the value of the produce of the soil, the higher, in reality, it makes the amount of the national debt, and thus adds to the weight of taxation upon that class which pays so great a portion of the interest of it. If the incomes of landlords are to be reduced by their rents being lowered, to correspond with wheat at five shillings per bushel, (which would lower bread to five pence per four pound loaf,) and tenants are not to be able to get more than a bare subsistence, the manufacturers must find the demand for their goods very materially lessened. Whether with such low prices of produce, and, consequently, such a *reduced circulation of money*, a sufficient amount of taxes can be raised to continue paying, for any length of time, the full amount of interest of our enormous

national debt, I leave to the consideration of those who are competent to form a more correct opinion on the subject than I am. Some newspapers," the author adds, "are continually giving statements of the comparative prices of wheat in England and on the continent. It is not the price of food in any country that proves whether it is cheap or dear; the proof is the relative value which the *wages* of the labouring classes bear to it;" but this these papers studiously avoid doing, truth not being their object.

NOTICES OF BOTANICAL PUBLICATIONS.

EDWARDS'S BOTANICAL REGISTER, continued by Dr. Lindley. The March number contains:—

1. *Stanhopea insignis*. Noble Stanhopea. This is certainly one of the finest of the order *Orchideæ*, or, as it is now pronounced and written, ORCHIDACEÆ, and of that natural order it belongs to the section VANDEÆ. It was described as *Epidendrum grandiflorum* by Humb. and Bonpl.; as *Anguloa grandiflora* by Kunth; and by its present name by Hooker and Lindley. The plant has been before figured, both in the Botanical Magazine and in the Botanical Cabinet; but the subscribers to the Register cannot but be gratified with this figure, as the flowers and dissections are represented with great accuracy.

The plant is a native of South America, and is one of those which produce their spikes in a dangling position; and therefore it requires to be potted high up in the pot, lest the sides obstruct the escape of the flower-stem.

2. *Kennedia glabrata*. Smooth-leaved Kennedia. A greenhouse climber, belonging to the natural order *Leguminosæ*; introduced into this country from New Holland, and flowered last year at Mr. Knight's, King's Road, Chelsea. The flowers are bright scarlet, with a green spot, bordered with brown, at the base of the standard.

3. *Tristania macrophylla*. Large-leaved Tristania. An Australian tree, which flowered last year in the collection of Richard Harrison, Esq., of Liverpool. With that gentleman it became a bush four feet high, and discharges its bark like the *Arbutus Andrachne*. The plant belongs to *Myrtaceæ*; the solitary flowers bear some resemblance to those of the barren strawberry, but the foliage is good and showy. Dr. Lindley has added some account of the five other species of the same genus, from information communicated by Mr. Allan Cunningham.

4. *Oenothera serotina*. Late-flowering Evening Primrose. This

plant has a very striking resemblance to many of its congeners. "It is considered, with reason, to be a mere variety of *Æ. fruticosa*, from which it differs more in habit than in any precise characters; its leaves are narrower and longer, its stem much less erect, and the leaves and inflorescence are not so far separated as in *Æ. fruticosa*." The *Æ. serotina* continues flowering into November. In a note under this plant, Dr. Lindley has withdrawn some of the asperity with which he had treated Mr. Spach in the last number of the Register, for his intermeddling with this genus, but without retracting any part of his general opinion as to the mischievousness of unnecessary changes of nomenclature.

5. *Corysanthes macrantha*. Large-flowered *Corysanthes*. "Accustomed as we are now become," says Dr. L., "to strange forms among orchideous plants, I doubt whether any species has yet been seen more remarkable for its unusual characters than that now represented. When the plant blossomed in Trinidad, the flowers appeared so extraordinary to those who saw them in the Botanic Garden, that they supposed them to be artificial. It has, however, lately flowered in the collection of Mr. Knight, of the King's Road; and it proves to be in all respects the same as the specimen sent to Dr. Hooker. Each flower is placed at the end of a long, stiff, cylindrical, furrowed ovary, and, when expanded, measures somewhat more than six inches from the tip of one sepal to that of the opposite one." The remainder of the description occupies nearly a page of the Register; for such is the grotesque figure and uncommon formation of the different members of the flower, that a description is no easy task. Nor is the representation of it by the pencil an easy affair; for in giving the outlines of some of the parts, others are so fore-shortened, that no just idea can be conveyed of the structure by the most accurate pencil.

6. *Lobelia decurrens*. Wing-stemmed *Lobelia*. Introduced some years since from Chili, although not yet very plentiful in our collections. It is described as not quite hardy enough to bear our winters, though it grows and flowers vigorously in a moist and shady peat border. The flowers are pale purple, and are thickly set on a leafy spike.

7. *Alstrœmeria aurantiaca*. Orange-flowered *Alstrœmeria*. This, like the other species, is a very ornamental plant, and has been accurately described by the Hon. and Rev. W. Herbert. It is almost hardy, living through our winters with a very slight protection. The stems do not entirely die down, but the old ones are succeeded by a new birth every spring. The tortuous position of the leaves is very conspicuous in this species.

SWEET'S BRITISH FLOWER-GARDEN, continued by Professor Don.
The March number contains :—

1. *Mandragora autumnalis*. Autumn-flowering Mandrake. This is a native of Italy, whence it was introduced into this country by the Hon. W. T. H. Fox Strangways, and specimens of it supplied from his collection at Abbotsbury in December last. Every body has heard of the Mandrake ; but it is very uncommon in English gardens, though well deserving a place in every herbaceous collection : both foliage and flowers are strikingly beautiful. It belongs to the natural order *Solanææ*.

2. *Narcissus conspicuus*. Showy Hoop-petticoat Narcissus. Among all this early-flowering and elegant tribe of bulbous plants, no one is more attractive than this ; its slender foliage and ample flowers having that member called the nectarium, or disk, disproportionally produced, certainly makes it well deserving of its specific name. The late Mr. Haworth separated this plant from the true *Narcissus*, under the name of *Corbularia conspicua*. This separation Professor Don does not entirely sanction, though unwilling to condemn decidedly the opinion of such an authority.

3. *Phacelia congesta*. Tufted-flowered Phacelia. An annual herbaceous plant, a native of Texas, where it was gathered by the late Mr. T. Drummond. Seeds were transmitted to the Glasgow Botanic Garden, and to Dr. Neill, of Edinburgh ; at both places plants were raised, and at the latter place a drawing was taken for the Flower-Garden. It continues in flower throughout the summer and autumn, and ripens seed freely in the open border.

4. *Zephyranthes Drummondii*. Drummond's Zephyranthes. "An elegant bulbous plant, (belonging to *Amaryllideæ*,) gathered in Texas by the late Mr. T. Drummond, to whose memory we have dedicated the species. The drawing is from the pencil of Mr. James Macnab, taken from a plant which flowered in the garden of Dr. Neill, of Edinburgh."

Messrs. Ridgway, of Piccadilly, announce a publication of figures of all the finest of GERANIACEÆ, to be executed in a very superior manner, by the first artists, and to be published in numbers, containing three plates each, every alternate month ; with full directions for their cultivation.

CALENDARIAL MEMORANDA FOR APRIL.

KITCHEN GARDEN.—The principal business of the kitchen gardener in this month, is attending to the crops which are already progressing, and putting in other crops to succeed those sown last month. The times for sowing crops during this month, depends very much on the appearance and progress made by those of the same kinds sown in autumn, or in the early months of the year. If these remain very backward, in consequence of the severity of the winter, or other casualty, the sowings of this month may be delayed till the previous sowings have advanced sufficiently far as to warrant putting in successions at this time. This observation applies particularly to peas and common beans, which, to have in perfection, the consecutive crops should succeed each other very regularly. If all the previous sowings are above ground, sow in the first, and again in the third week.

Kidney Beans.—Towards the end of the month a first sowing of the early dwarf-speckled sort may be put in, on a dry warm-lying border. Some gardeners make it a practice to sow twice in this month, notwithstanding neither the first nor second sowings can be much depended on, because a very slight frost in the beginning of May will kill both, if above ground; still, if either escape, they will yield pods at an acceptable time. A much safer and more certain way is to sow in one-light boxes thickly, whence they may be transplanted into the open ground as soon as the May frosts are no longer to be expected—say about the middle of the month. Some ingenious practitioners, who have the convenience of forcing-houses, sow French beans for planting out much earlier, both dwarfs and runners; and by keeping the plants very dry, and stopping their leading shoots as often as they come forth, induce a dwarfish habit; and, as soon as put out in the open air, show flowers immediately, and supply the table much sooner than any later-sown crop.

Cauliflower.—The observations made last month are applicable now, if any of the directions have not been executed. Those under hand-glasses will now be growing rapidly, requiring the glasses to be tilted, and refreshings of manured water occasionally given to assist the growth. If seedlings raised on heat in February be gaining strength, they also should be assisted by water, or whatever else will expedite their growth, in order to their being planted out for good. About the middle of the month, sow a seed-bed for raising plants for the Michaelmas crop.

Broccoli.—At the same time, separate seed-beds of all the different sorts of common broccoli may be sown also; and likewise all other

sorts and varieties of the same tribe of plants; viz. cabbage, savoy and red ditto, Brussels sprouts, Scotch kale, and all the other sorts of broccoli.

Turnips.—A good piece of turnips may now be sown on an open light spot of ground; celery on a warm border; lettuce, radish, and all other salad-plants twice in the month.

Potatoes.—This is, perhaps, the best season for planting potatoes; if planted earlier, their tops may be frost-bitten in May; and if planted later, a dry summer (as last year) prevents the production of a full crop.

Additional sowings of onions, carrots, and several other culinary plants, may be made in this month, but which it is unnecessary to particularise.

FRUIT GARDEN.—The pruning, nailing, and tying being all finished in this department, the only circumstance now requiring attention is the protection of the blossoms of peach, nectarine, apricot, plum, and cherry trees, against night-frosts and bright sunshine.—For our opinions on this very important part of the fruit-grower's business, we beg to refer our readers to what appears in our number for May, 1835.—Grafting may still be performed, especially if the grafts have been cut for some time previous.

FLOWER GARDEN.—This is now becoming more interesting than it is at any other time in the year. Many bulbous flowers are in bloom, and many others fast advancing to their greatest beauty. An opening flower has more attraction about it than a full-blown one, and for this reason:—imagination assists our perceptions in the first case, but not in the second. The auricula stage, and the tulip and hyacinth beds, as well as those of anemones and ranunculuses, are all becoming, day after day, more interesting, and consequently require every care of the manager. Some will require top-dressing; others propping, or shading, or watering: and many preparations must now be made to perpetuate the gaiety of spring throughout the summer and autumn quarters.

The Dahlia and Chinese Chrysanthemums claim especial care at this season.—For the treatment of the first, see our review of "*The Annual Dahlia Register*" in this number, in which some pertinent extracts will be found.—The old stools of Chrysanthemums may be divided, if not already done; the most likely slips potted; or cuttings may be made of them for the like purpose, for the service of the greenhouse, conservatory, or other place, and against open walls, where they blow well till destroyed by frost. Obtaining dwarfed-growing and more bushy plants for the greenhouse, is done by layering the shoots later in the season, at which time the process will be noticed.

REMARKS ON THE WEATHER.

ACCORDING to the old saying, March "came in like a lion;" but whether it will "go out like a lamb," does not yet appear. At the beginning, there was much snow in the western counties, and everywhere a rather unusual fall of rain. The equinoctial gales, which commonly occur between the eighteenth and twenty-fourth days of the month, set in as early as the eleventh, and continued with considerable violence for several days afterward. Meteorologists consider that from tables formed from actual observations of many years, and with the best instruments, the mean evaporation during the month exceeds the mean quantity of rain which falls by forty-eight tenths of an inch; but, as far as we have yet experienced, the fall of rain will greatly exceed the amount of evaporation. This result is not considered favourable to vegetation generally, more especially to the crops of the fields. Hence another old saying, that "a peck of March dust is worth a king's ransom;" because, from the long-continued cold and moisture of winter, plants become dormant or languid, and, of course, are rapidly recovered, and put into healthy action, by the drying winds and increasing temperature of the first month of spring.

Almond trees about London were half blown on the eighteenth, and on the nineteenth and twentieth the air was so mild as to bring forth the female wasps to find a place to breed in, and the brimstone and peacock butterflies in search of food. Since then the air has been colder, with frequent showers of rain or sleet, which keeps everything in gardens backward. There have been, however, no serious night-frosts lately; and while the weather continues so changeable, they are not so likely to occur, though they should always be dreaded, and averted, if possible, by the gardener.

March 25th, 1836.

PAXTON'S
HORTICULTURAL REGISTER,
MAY, 1836.

HORTICULTURE.

THOUGHTS UPON THE CULTURE OF THE PEAR.

Nottingham, February 24th, 1836.

SIR,—Considering, from the prevailing character of your work, that you rather encourage than otherwise communications from correspondents, who, though not professionally skilled, are interested in the main objects of your publication, I trouble you with a few observations on a subject upon which you have promised some further directions and information. Among the fruits upon which you treat, I think the pear well deserving more attention than it usually meets with in most gardens. This may be accounted for without any imputations on the conductors of them. The culture of it does not require that scientific knowledge and professional education which the successful management of the vine, pine-apple, &c., demands, and, consequently, does not excite that emulation and inquiry which have led to so much better an acquaintance with the habits, qualities, and improved production of more favoured fruits. But if the merit of the fruit constitute the fairest claim to attention, I greatly doubt whether the pear may not compete with many of those which are only produced at much cost and trouble. Whenever a really good pear has appeared at table, furnished by the gardener at its proper season, and at its matured period of ripening on the shelf, and not sent in at haphazard by the housekeeper to “make a dish,” it has seemed to me to have been as generally and as much enjoyed as our more exotic fruits. And it has this advantage over some of them, that whereas the different sorts of the peach and

nectarine, however selected, can scarcely have their season protracted beyond four or five weeks when grown in the open air, yet if, in the selection of the various sorts, due attention be paid to the period of their ripening on the tree and after being gathered, pears may be furnished of the finest quality for about ten months out of the twelve: this, too, at such little trouble and expense, especially when not requiring a wall, as to be within the reach of every class of society, where there may be the command of a few roods of ground—a great consideration with every liberal mind. To promote this (in my opinion desirable) point, I am anxious to engage your assistance and that of your practical correspondents in ascertaining as far as possible the merits and qualities of the different varieties introduced of late years, when grown in the midland and northern counties, and especially as standards and espaliers, though of course any fresh information respecting their treatment, when trained against walls, would also be an acceptable addition. For the purpose of obtaining practical information on this head, I venture to suggest to such of your readers as may feel an interest in the subject, and will not grudge the trouble, some such table or register as I have myself adopted for a few seasons, and from which I add an extract in illustration.

No.	Letter.	When planted.	Where procured.	Name.	Situation and Aspect.	When in full blossom.	When gathered.	Produce.	When brought to table.	How long in perfection.
17	B	1831	Thirsk	Passe Colmar	S. Wall	Mar. 15	Sept. 30	162	Oct. 30	to Nov. 30
15		1821	York	Chaumontelle	E. Wall	25	Oct. 5	220	Nov. 10	Jan. 4
15	A	1826	Ditto	Ditto	Standard	25	10	84	Dec. 4	15
19	B	1830	Leigh Court	Doyenné gris	E. Wall	16	Sept. 25	120	Oct. 4	Oct. 20*

* One accidentally left on the tree (sound and firm) till November 10th.

The first and the last show the early age at which they bear.

Regarding the chaumontelles, I wish to remark, that, although No. 15 was planted against an east wall in the year 1821, and grew well, yet it bore fruit for the first time only the same season as No. 15 A and another standard did, though planted five years later, and though the fruit of the first exceeded considerably the latter in size, yet not, I thought, in flavour. As another proof that the present use of the knife in wall-training considerably retards the growth of the tree and the production of fruit spurs, I may mention that of two Ashton Town pear trees, of equal size and good condition, planted five years ago, the one placed in the orchard as a standard blossomed abundantly last year, and would have borne a crop but for a severe

frost in the middle of April; whilst the other against an east wall had not attained half the size, and had not above two or three infant spurs. Now if some of your observant correspondents would once in two or three years favour you with a return of similar memoranda, with their remarks, adding, at the same time, the nature of the soil, subsoil, elevation, and aspect of their orchards and gardens, it might, I conceive, be the means of furnishing very useful directions to all, in the neighbouring counties, desirous of securing the best and most productive varieties. It would save trouble to have their observations directed chiefly (when so many sorts under so many names are cultivated) to those excellent Flemish and French ones not long introduced, and of which your two lists, page 834, vol. i. and page 485, vol. ii., contain an ample list, and, indeed, I must hope, of the best, as in my small collection I find I have twenty-five out of the thirty (not bakers) mentioned in the last, and forty-one of the former. Of many of these, my trees being mostly very young, I cannot speak from my own experience, but I can most highly of those already named in the preceding table, and also the Glout Morceau, Marie Louise, Napoleon, Winter Nelis, Vallée Franche, and the Beurrés Diel and Easter, and particularly for their early and free bearing. The Urbaniste, too, usually held to require a wall, bore abundantly and good fruit as a standard last year, when almost all the blossoms of others were destroyed by the frost of April 16th. All those against my walls were effectually protected by coverings of calico cloth sewn together, two or three breadths, according to the height of the wall; being only $2\frac{1}{2}d.$ or $2\frac{3}{4}d.$ per yard, two feet wide: the expense is trifling, and as my curtain are readily drawn aside every morning, the closeness of the texture is not objectionable. I will not trouble you with my mode of putting them up. Every one prefers his own, and it might make a tedious letter yet more tedious. I shall only add respecting them, that later in the season I protect my ripe currants with them, and, after being washed and folded, they are spread over the pears in the winter on the shelves, which assists in preserving them. Woollen nets, or any nets, I am convinced are of little or no use in keeping off frost; but whatever article be used, it should be dipped, for durability, in Mr. Kyan's *anti-rot* composition—corrosive sublimate and water—the proportions I forget, but, probably, you know them.

Whilst speaking of protection from frost, I must take the opportunity of mentioning a beautiful and cheap article made here (*eight feet wide, at 10d. per yard !!*) by Mr. Brough, of Pelham-street, which he terms his “conservative” lace-net. It is an effectual guard against wasps and flies, when placed before fruit-trees, and, being so very open, most

valuable, when applied on light frames, for excluding them from grape-houses or admitting air.

Since writing the last few lines, I find Mr. Kyan's composition cannot be used without infringing upon his patent: my recommendation of it was found in the "Arcana of Science," a work worthy your attention, published annually.

Regarding the training of trees, I shall leave that in better hands, recollecting your promise, merely confining myself to the recommendation of using **VERY FINE** copper wire, instead of shreds, for the smaller branches, and such as are not growing too vigorously, in which case, if not loosened in time, the wire is apt to cut into the bark; it should not *encircle* the shoot, but being about four and a half inches long, the centre part wrapped twice round the root of the nail, then the two ends brought wide of each other and loosely over the shoot, and each end whipped round the head of the nail, then loosened as the branch increases. The wire being so fine does no injury even if left on, breaking from exposure to the weather in a certain time. The nails should *never* be drawn out, if not in the way.

Should you think any suggestion in this letter worth notice, or likely to *lead* to any good, you are at liberty to insert any part of it in your publication, or make what use of it you like. My only object is to draw more attention to a fruit, not so much regarded as, in my opinion, it deserves.

Your obedient servant,

PYROPHILOS.

LANDSCAPE GARDENING.

LETTER ELEVEN.

MY DEAR SIR.—I have no doubt you will agree with me in the opinion that the pleasure of equestrian exercises, free from the dust and constant annoyance of a public road, is one of the highest gratifications arising from the possession of so extensive a park as this. Between the hours of breakfast and dinner I very often accompany my friend, and other members of the family, in taking a morning ride, either in the park or over the adjacent farm. The latter is a *ferme ornée*, on the plan of Shenstone, having hedge-row elms and green headlands, traversible by either riders or drivers:—but of this more hereafter. The park, you will easily conceive, is a delightful field for enjoying a quiet ride;—no obstructions of gates or fences (unless you choose to pass through the coppice for the sake of variety), nor are you,

except in those coppices, condemned to keep a beaten or prescribed tract, but, with all the freedom of an inhabitant of the air, you can turn wherever fancy leads, or to whatever object may attract your attention. Should you wish to look out upon the surrounding country, you have only to gain some little knoll or eminence which surmounts the park pales. If the heat of the sun be oppressive, you may thread your way through the open groves, or wind your course along the shady side of the open glades. Here is no continuous circumscribing *belt* to confine and drag along the listless perambulator, impatient of such control ; no obtrusive barrier, or menacing boundary to check your steps. In short, the ever-varying combinations of woods and lawn are so pleasingly disposed that you are instinctively, as it were, led from scene to scene, with increasing interest, to the point whence you set out.

This style of enriching and embellishing the outskirts of a park is infinitely better than that of surrounding every one with a meagre strip of plantation, called a *belt* by Brown and his imitators. This indispensable feature of the Brownian style of improving a park by planting, had three very obvious faults ; it was always too long, and too narrow, and in general, being planted with an intermixture of the same kind of trees, had always a tedious and uninteresting effect, whether seen from within or without. The *belt* appears to have been adopted at first as a means of marking, more ostensibly, the extent or boundary of the park, and as a sign of the appropriation of the land it circumscribed to the more immediate use of the proprietor. The idea of carrying a *ride* through it was very natural, because it was not only having a *ride* of the greatest possible length within the park, but also allowed the owner an opportunity of observing at pleasure the progress made by his young trees.

When belts were young, they were much less an eyesore than they became after fifteen or twenty years' growth : the trees then began to get naked at bottom, and the sky being seen through, among the naked boles, declared at once their destitution of two of the principal beauties of a wood, namely, *depth* and *massiveness*. And as the belt very frequently occupied the highest ground, or horizon, they became exceedingly ugly, and, of course, were condemned by every eye of taste.

This, at one time very fashionable feature, together with its defects, has been studiously avoided in planting the park of which I am writing. The real boundary, or park-paling, is never visible from any commanding station ; and is generally placed on lower ground than the surface of the park immediately within. This gives a freedom to the eye in riding round the verge of the park ; and, as the plantations are

variously placed as regards their distance from the real boundary, no idea is given of its proximity by any lineal disposition of the trees.

I cannot, however, convey to you any thing like a perfect idea of the beauty and great variety of ever-changing scenes, which strike the eye and arrest the attention of the beholder, in making a tour of Fairfax Park. The advancing and receding masses of wood; the opening and closing of the glades and vistas, sometimes extending quite across the park, or shut up at shorter distances, ever shifting with the position of the spectator, are circumstances which constantly employ and please the mind of the perambulator.

Various objects, within as well as without the park, serve to heighten the value of this sylvan scenery. Within, there are cattle sheds, having some little architectural character bestowed on them; now and then we have a glimpse of the mansion-house, or of the lake, with its accompaniments; and in many places there are seats for pedestrians. Every object of interest in the country around, may also be seen from some one station or another, from within;—such as churches, castles, or distant prospects. So that while enjoying the idea of privacy and security, which a ramble in the park never fails to excite, these preclude not the roving eye which inclines to look on the world around.

The rides in the park are considerably extended by gates, in various directions, opening to the country around, but particularly into the farm, already mentioned. This is a very complete concern, of about two hundred acres, kept on hand for the service of the establishment; and is managed by a steward, who resides at the homestead, about a mile to the north-westward of the hall.

The management and stocking of the park is very intimately connected with the farm; indeed, from what I have previously told you of the former, of its groves, and lake, and rides, &c., I should not be surprised if you have formed an opinion that the whole is a large expanse of *barren* pleasure-ground. But I can assure you, from what I have learnt, that the park is fully as profitable as the arable land, and without its assistance the farm would be scarcely worth cultivation. It enables the steward to keep a vast herd of all kinds of profitable live stock, whence ample supplies of the richest dress are afforded for the arable land, and which, in consequence, is doubly productive. All the hay consumed on the estate is grown in the park: a line of iron hurdles divides the meadow ground, below the lake, from the high pastures, nearer the house; and remain till the hay is cut, made, and carried. A principal part of this is carted to the homestead, but there

is always a large rick made in an enclosure, where there is a winter foraging yard, at the bottom of the park.

The live stock, depastured in the park, are Scotch and Welsh cattle, South Down sheep, and there is always a number of yearling colts and fillies, as well as heifers, bought in every year, to have a winter and summer run, and grow into money. The pasture is not rich enough for the larger breeds of cattle and sheep; though of the first, a few Herefords and Durhams are purchased in the autumn, for stall-feeding; and of the second, a score or two of Dorset or Wiltshire ewes are purchased at the same time, to be fed off with their lambs on turnips. There is also kept in the park a small herd of the fallow deer, more for ornament than for any profit made of them. They are great favourites with the ladies of the family, and a plaything for the keeper, who, however, can send some very prime venison to table in the season.

I have imbibed so much of the elements of agriculture and rural economy since my sojourn here, that I should hardly be afraid to become a farmer myself, if the business were again a profitable one. But I can see pretty clearly, that unless I had just such a park, or an equal extent of meadow and pasture to keep live stock on—had free access to a long purse—and held at a pepper-corn rent, my humble name would soon figure in the gazette.

The farm, I understand, is cultivated on what is called the four-course system—the rotation of cropping one field for four years will give you an idea of the whole. The first year, a clear fallow and dunged for turnips,—these are fed off by ewes and lambs, and wethers folded, between the first of November and middle of April, in ordinary seasons. As soon as the turnips are off, in the second year, the ground is prepared and sown with barley and clover, and with or without rye-grass, mixed. In the third year, the clover is mown once or twice, and made into winter fodder; and about Michaelmas the ley is ploughed, and sown with wheat, which completes the course. As soon as the wheat is carried in the fourth year, a part of the stubble is dunged and sown with winter tares, to be cut green, in the spring of the fifth year, the ground the tares occupied falling into the fallow. This is the usual routine of cropping a turnip-land farm, and is very generally adopted.

The farm is fitted with every necessary building; the dairy is elegant, and always well supplied, from a select drove of Ayrshire and small short-horn cows; the fields well proportioned, and divided by hedge and ditch fences. There is a fair sprinkling of timber trees in the hedges, and some of the angles of the fields are planted;

which gives the whole a very dressy look ; and when fully cropped, a ride along its green head-lands must be as interesting to a visiter as any other portion of the estate.

I dare say you begin to perceive that a complete country seat is composed of many different parts, all contributing to the comfort and convenience, as well as to the pleasure and profit, of the possessor. Without such arrangements as belong to the architect and landscape gardener to create, and which always ensures, or have a tendency to ensure, every domestic and, at the same time, every out-of-door agreeable convenience and befitting disposition, no honour can redound to the artists, nor satisfaction to their employer. As I have stated before, the *utile* must be so blended with the *dulce* that no sacrifice should be made entirely for the sake of the last, nor no poverty of design be allowed to prevail or disfigure the natural beauties of the place for the sake of the first. Because you may observe from the description I have endeavoured to give, that the ornamental plantations are every year increasing in value, and at a higher rate than any other crop or crops which could be raised in the same time upon the ground they occupy ; and, moreover, their tasteful disposition adds a vast additional value to the estate, independent entirely of the value of the timber they contain. Neither can the extent of pasture land be said to be a waste of good ground ; for calculating on the great number of live stock it constantly maintains, it probably pays as well as if it were under the plough. In these instances, therefore, no sacrifice of the local or natural value of the land is made to the detriment of the proprietor.

The lake, indeed, may be objected to as a waste of good meadow land, and so it is ; but when we consider how much the beauty, and consequently the value, of the estate is enhanced by the existence of such a splendid feature, no one can deem it an *extravagant* luxury ; more especially as it contributes so much to the rational gratification of its generous and amiable possessor.

I have intentionally mentioned all those particulars belonging to this well-designed country seat, to show how many things should engage the attention of a landscape gardener, who may be employed to lay out a new place. You and I used to think that the decorative part was the only proper province of the ground improver, or landscape gardener, or whatever other title he assumed ; that his special business was only to beautify the place by smoothing what was rough, clothing what was naked, putting in order irregularities, or curving what was stiffly straight ; in short, to make pretty pictures of whatever or wherever he could, and by all means to give a dressy or *holiday-look* to every thing he touched, and to every disposition he made ; and all this only

in the immediate vicinity of the house, or on what may be called the pleasure-ground. Such, I say, was what I considered the principal duty of a landscape gardener; but since I have been here, I begin to see that that charming art involves matters of much greater moment than the mere embellishment of the place.

A beautiful residence has always its charms, and constitutes a principal part of its value, but beauty alone is not enough; more especially as it need never be unaccompanied with more substantial excellencies in the country. There is a heartfelt and lasting gratification to the mind of a proprietor who has embellished his country seat to his utmost satisfaction, and is sensible that no sacrifice has been made of its natural or real value. When he annually finds that the returns from the improved productive parts pay all the charges of the dressed or unproductive parts. When, in fact, the land-steward pays all expenses of his gardens, of his park, and of his stud, besides supplying the family with every description of farm produce. These are material matters to the country gentleman whatever his fortune may be; because, besides saving, there is a peculiar pleasure arising from the use of what is grown or fatted by one's own means, and an independance of markets and tradesmen particularly satisfactory.

It has been with such views that the estate of Fairfax Hall has been designed, for such are surely the effects of the well-balanced dispositions and union of the *sweet* with the *useful*. That it has come gradually to what it is, there can be no doubt; but the general plan has been well conceived and executed is very evident. The *genius* of the place has been well studied; the general surface is gently undulating, and consequently simply beautiful. With this character, therefore, every thing superinduced must correspond, and this has been done with very good judgment. The simple Grecian style of the buildings, the soft-featured and fresh verdure of the most conspicuous trees, and the general smoothness of the turf, all convey the idea of unmixed beauty. Nothing bearing a picturesque character would have been admissible here. A castellated or a Gothic mansion on such a spot would have been horrible; nor could all the art and all the powers of man been competent to have moulded the natural features of this place, so as to have made them harmonize with such an object. And yet how often do we see such egregious mistakes committed? In one place a splendid Corinthian palace built in a mountainous country, amid rocks and cliffs and deep ravines; in another, a gloomy Gothic pile set among some of the loveliest scenes of nature! This is bad taste; and the architect who could suggest such an incongruity is unfit for his profession; and the employer who could take such advice, will

have just cause to repent when, perhaps, it is too late. It must be admitted, however, that it very often happens that the employer fixes the style of architecture himself; he resolves to have a castle, an abbey, or an Elizabethan mansion to live in, while totally regardless of whether his place be suitable or not for either of those styles of building; but having formed such a resolution, it would be a strange thing indeed if he did not find some architect or other to give him a plan. Thus many anomalies of the kind are executed where pure taste is wanting or not exercised.

I have been led into the foregoing remarks by having seen in the neighbourhood of this place a gentleman's residence highly ornamented, but in quite a different style from that of Fairfax Hall.

This is the celebrated ——— Abbey, now the property of, and converted into a splendid country residence for, a gentleman of the most polished taste. As part of the original buildings, as they stood in the time of Henry VII. still remain, a principal new part has been added and finished in the original style of architecture in which the abbey was first built. Its situation is in a narrow valley and on the bank of a lively little stream. We enter the place from the eastward through a lofty Gothic arch and massive iron gates flanked by high walls. Proceeding along the approach or carriage road to the house, the new visitor is kept a considerable time in suspense by passing through a dense thicket of lofty trees and holly underwood, causing a kind of solemn gloom, till he arrives at the end of a fine Gothic corridor which leads to the principal door of the abbey. This approach is very well managed; for, passing through twilight from the outer gate and coming so suddenly upon an imposing mass of building, *composed* and ornamented in Bernasconi's best manner, strikes the stranger most forcibly; and, on entering the apartments, we are surprised at their amplitude, and the massive character of the furniture, and fittings-up of the interior. Every object within reminds you of times long past, but at the same time they are all vamped up in every modern elegance. As a *retreat* from the busy scenes of life, it is highly in character. There is no prospect from the windows, the views from each being all confined and only penetrating a little way into the depths of the surrounding woods, which are chiefly composed of pines and cedars and other sombre tinted trees. There are about three or four acres of lawn of the freshest green turf surrounding the house, on which stand a few immense oaks, large cedars of Lebanon, and some very ancient mulberry trees.

It appears from the mounds still traceable about the buildings, that they were once surrounded by a moat, the usual appendage to religious establishments in early times. This, however, is now all filled up

except the side to the eastward of the abbey, along which there remains a part of the ancient terrace-walk, which, no doubt, once encompassed the whole. From this terrace-walk a stranger perceives, for the first time, that the river issues from under an arch nearly opposite the corridor before mentioned, and that it is tunnelled under the approach, in order that no anticipation of the existence of water may be had till the house is reached.

The kitchen garden lies to the westward and somewhat in the rear of the house, is walled around, and at the front wall, which is exposed to the dressed lawn; there is a bit of pleasure ground planted with shrubs and flowers.

The view from the south windows down the valley, with the river sparkling here and there, is the best, and, though bounded by lofty woods on each side, is very interesting; but the view from the lower end upwards is truly and magnificently picturesque. From hence the abbey appears in all its grandeur, occupying a little eminence in the middle of the valley; its various members of buttresses, pinnacles, turrets, embattled parapets, projecting mouldings, with their deep shadows, together with the glistening vanes of the turrets, altogether present an object of the most imposing character; and being embosomed in "tufted" headed trees, contrasting so well with the prevailing perpendicular lines of the Gothic architecture, is a most harmonious association, and a subject worthy the most expert disciple of Claude Lorraine.

(To be continued.)

MISCELLANEOUS INTELLIGENCE.

REMINISCENCES OF A VOYAGE TO AND FROM CHINA (continued from page 149).—So much is the love of flowers predominant in China, that almost every window-sill and every bit of a court in front or yard behind the houses of the shopkeepers and tradesmen are filled with plants either in the ground or in pots of different shapes, sizes, and colours. Some of the finest specimens of the Chinese *magnolias* we met with in the back courts of some of the merchants' houses; and in such confined places there are what they call complete pleasure-gardens to be seen. We will describe only one of these, to serve as a sample of their taste.

In a back court belonging to *Sinchong*, the great china-ware manufacturer, we saw one of these gardens on a very small scale indeed. It occupied one corner of a paved yard, and consisted of a little irregular pool of water, in a nook of which grew a *Leinfœa* (*Nelumbium spe-*

ciosum), and in another, a fine plant of the *Tow-cow* (*Alpinia nutans*). The pool was surrounded by rugged stones, and an arch of the same was carried over to represent the mouth of a rocky cave. Between, and in the cavities of the stones, plants of the black bamboo were stuck here and there, to hang over the water, and roots of asparagus, which, with their slender and regularly branched stems of different heights, represented groves of trees. Around, and on the shelves of the stones, dwarfed trees, in pots covered with fragments of rock, were placed, and partly covered with moss and lichen and pieces of algæ brought from the sea shore, altogether forming a spectacle of the most grotesque character. Such things we saw in many other places; and we verily believe that if a Chinese had a field of ten acres to beautify in his own style, it would be covered with the same kind of little fanciful freaks repeated a thousand times over.

Their kitchen gardening is all carried on in the open fields surrounding the city, and, from what we saw of the preparations making for the summer crops, we conclude that they are upon the whole excellent kitchen gardeners. Not a weed was to be seen, and they are at very great pains in keeping their land in heart by manuring. Night-soil and the scouring of canals and ditches is their customary dress; for, in a country where no domestic animals are kept except pigs and aquatic poultry, the husbandman cannot easily be supplied with manure. They grow Batavian endive in very great perfection; likewise the rhizomas or under-ground stems of the *arum indicum* (?), which is a staple commodity with the market gardeners, and seems to be an indispensable article in Chinese cookery. The tuberous roots of the water-lily which they drag out of their numerous canals is another plentiful vegetable in the markets, and which they use in the same manner as the foregoing, i. e. as an ingredient in their stews.

The Company's officers had a kitchen garden of their own about three miles distant from the city on the north side, and in which they endeavoured to get the native gardeners to grow as many of the European vegetables as their skill or the climate would permit. Some things they grew, we believe, pretty well, but they could not grow onions to please their employers, persisting in the unnecessary expedient of growing them year after year from offsets instead of from seed. The gentlemen of the factory had leave of the Hoppo (governor) that we should proceed with one of his officers and an interpreter to the garden, and give the necessary instructions for sowing the seed, &c. The gardeners were apprised beforehand of our intended visit, and, on our arrival at the ground, we were met by half a dozen very respectable looking men. Our directions were quickly given: they attended to

every word that was said with that provoking kind of expression on their countenances which bespoke the most extreme incredulity. We repeated our advice again and again, but got no answer but a loud horse-laugh, and their national maxim of *No can do: Europe fashion no do in China*. We left them as conceited as ever, and, no doubt, while they pitied us in their minds, laughed heartily at the circumstance of a *Europe fool-man* being sent so far to talk foolishness.

Howbeit, we had our reward in seeing so much of the open country. We passed through several villages, where we were objects of much curiosity to the women and children, who cautiously peeped from behind their doors (which are hung on hinges at the top), but shut them close while we passed. Their cottages were, however, remarkably clean and neat, and the inhabitants appeared in comfortable circumstances. But we had other objects to attend to. The country is pretty well wooded, especially near the villages, and consisted chiefly of *Laurus cassia* and *sassafras*, *Steroulia platanifolia*, *Euphoria lüchi* and *longana*, *Guarea grandiflora*, *Averrhoa carambola*, &c. But the most magnificent tree, both for its size and the rich colour of its flowers, which decorated all that part of the suburbs of Canton at that time (beginning of March), was the *Bombax ceiba* or silk-cotton-tree. The flowers, like many other Chinese plants, appear before the leaves, are about the size of a middling tulip, and of a bright scarlet colour. They are thickly set on the branches, so much so, that the trees, at the distance of half a mile, appear mantled in this conspicuous colour. The tree, in the colour of its bark, size of bole, and ramification of the branches, resembles the largest walnut trees of this country. The timber is much used by the carpenters for various purposes, among others, that of making coffins, which are formed by the four rough slabs cut off by the pit-saw, and just nailed together again, head and foot pieces being afterwards added. We mention this, because on this excursion our path lay through a carpenter's yard, where we saw many very large butts of this tree; and, immediately after, over a burying-ground, where we saw the recently-placed coffins only covered with a thin turf, which did not even confine the stench arising from the corrupting bodies. It is the custom, it seems, to expose the coffins for a certain number of days, after which they are removed to a square brick building in the middle of the burying-ground, and there, bodies and coffins together, consumed to ashes by fire.

We passed a plantation of tea, which did not occupy more than an acre and a half of ground. It seemed a smaller leaved variety than either of those called green and bohea, known in this country. The ground was quite free from weeds, and the bushes were about four feet high, and planted at distances of about six feet apart. They were

very branchy, and had a feeble, stunted look, caused, no doubt, by the defoliation to which they are so often subjected. Tea is very little cultivated about Canton, and this, the interpreter told me, was only kept for the private use of the owner.

The whole arable face of the country is uninclosed, no part of the surface being lost by either fences or high roads. Canals answer the purpose of the latter, and footpaths serve for the former. Nor are fences necessary where no cattle are depastured, nor where neither waifs are sought or strays intrude. Tanks or ponds are in every garden, not only for supplying the crops in dry weather, but for fattening a few fish for sale.

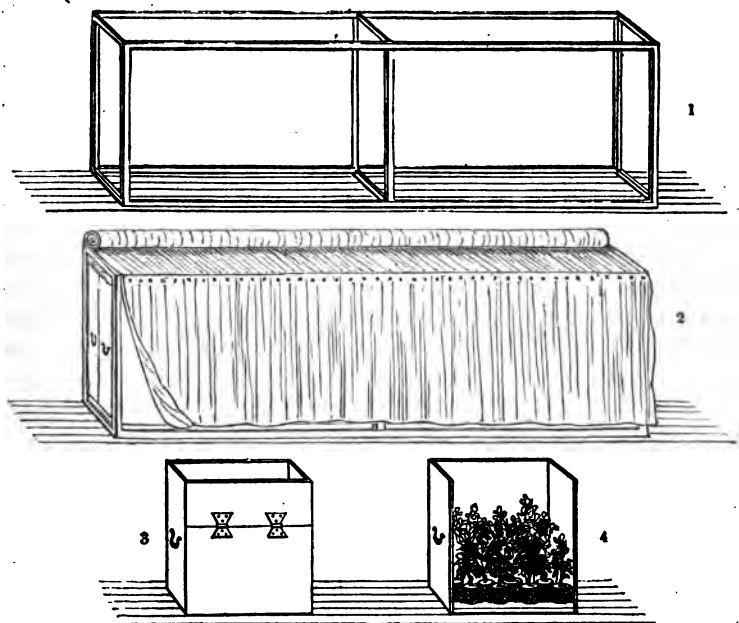
It was not the season of the year for seeing the crops of their kitchen-garden grounds, and we therefore know much less of their productions and modes of culture than if it had been at midsummer or in the autumn. They break up the surface with large hoes, and smooth it with rakes, and the manure is applied from a pail and a wooden spatula. In the northern provinces, and, particularly, for preparing land for rice, draught oxen and ploughs are used, but nothing of the kind is seen about Canton. Nor did we see a horse all the time we were there except one, and that was a white pony rode by a mandarin of the first rank.

The policy of the Chinese government in prohibiting the importation of foreign food and all kinds of luxuries, necessarily compels the numerous population to cultivate every square yard of ground for their ordinary subsistence. Notwithstanding this restriction on the appetites of the community, no nation in the world, perhaps, live better than the Chinese. They have what may be called two dinners in the day, at ten in the morning and four in the afternoon, both most substantial meals. They use boiled rice instead of bread, and their standing dishes are stews, in which several kinds of vegetables are sliced, and always enriched with pork or duck or goose, which has been previously roasted, and afterwards cut into small pieces for the stew. For drink at these meals they have tea, but without either milk or sugar: indeed, tea is partaken of at all times in the day, but never as a meal. After the afternoon dinner, very little business is done by those engaged in trade, that time being given to play, smoking tobacco, and drinking *Samshoo*, an ardent spirit of the nature of *arrack*.

This description is of what we observed among the mercantile people at Canton. To the tables of the more opulent people we had no access, but we were told their style of living is very similar to that described; but when they give entertainments to European gentlemen, the table is spread and furnished in the European style.

Let us now turn to the preparations made for packing and transplant-

ing the plants. There were two places in the ship allowed us to stow the boxes. The first was the stern balcony, which was deemed a very suitable station, being airy, shady, and completely out of the way of working the ship. The second and principal place was that portion of the poop deck extending from the skylight aft to the stern-knees, and between the two middle tier of hen-coops. This space had a fixed frame erected over it, and covered with moveable planks ranging fore and aft, to be kept on when the business of the ship required, and taken off entirely at all other times. Besides this planking, which formed a platform for the men to stand on when necessary, we had canvas curtains to cover the whole platform when the spray was dashed over that part of the ship. See the annexed figures.



REFERENCE.

Fig. 1. The frame of the awning.

Fig. 2. The frame covered with canvas. One side down and fastened when necessary. End canvass turned back to show the ends of the boxes within. The other side of the canvass rolled up.

Fig. 3. One of the boxes, two feet ten inches long, two feet wide, and two feet ten inches high, having strong handles at each end, and a part of one of the sides moveable downwards on hinges for admitting more air.

Fig. 4. Manner of packing the plants.

The height of the frame in all cases should be below a right line passing between the crutch or stern-rail abaft to the top of the forward rail of the poop, that the boxes or frame may not be in the way of unshipping the driver-boom or mizen-yard.

When we made our selection of plants, we preferred placing them in strong cane baskets of a proper size rather than putting them into glazed China pots, because the latter we thought were too attractive of heat and less pervious to air or moisture. The plants were placed in these baskets as soon as received, and kept in a shady yard till they were packed in the boxes a few days before the ship was to sail. The boxes had all double bottoms, both pierced with a good many holes. The second bottom, on which the plants stood, was necessary, lest the sea water in washing the deck should reach the roots.

The moss which we brought from England was used in packing the plants; each basket was plunged in it, with a thin covering of the same over the surfaces. Thus placed, the baskets were secured by cross ledges of wood to keep them steady while on their way to their berths in the ship. A few plants of the *Paonia mou-tan* were received as presents to Sir Joseph Banks and our employer Mr. Slater, and which were kept in the pots just as they were received. These were all kept in the stern balcony during the voyage.

The plants selected for bringing to Europe were as follows:—Six plants of the *Paonia mou-tan*, three varieties, viz., yellow, pale purple, and red. One of the pink or pale purple ones was kept in the pot in which it was received, the others were shifted into baskets, and placed in the boxes along with the other plants. Besides these, we had the charge of two or three others, as before said, addressed to Sir Joseph Banks for the Kew collection. Some of these plants had been brought to Canton the year before; others arrived while we were there. The former, being better established in the pots, bore the voyage home much better than those which had been shifted.

Very little is known of these highly-valued plants by the nurserymen at Canton. They are natives of and much cultivated in the province of *Nankin*, whence good specimens are annually sent as presents to Canton, just before they come into bloom. These, when done flowering, are for the most part thrown away, as it is believed they will not flower a second time at Canton. This is not necessarily so, either from the nature of the plant or from the difference of the climate, but it is very likely to be so from bad usage and neglect. We turned out several which had just arrived from *Nankin*, and found them most barbarously used. It appeared they had been raised from the open ground, and out of strong alluvial soil, having all the points of their thick finger-like roots *docked short off* to fit a small pot for the convenience of carriage. Plants so roughly treated may retain inherent power to bloom once, but much good nursing would be required to make them blow in the year following. In short, it seems the *Nankinese* treat their *pæonies*

as we do potted carnations in Britain,—when the flowering is over, and the layers removed, the old root is thrown away.

There are wonderful stories current at Canton about the vast varieties of the pæony which are known in the northern provinces of the empire. There, they say, the cultivators have them of all colours, even *blue* and *black*! That they have many varieties of the herbaceous sorts, is more than probable; but that they possess such a variety of the shrubby sorts, is extremely doubtful.

The next most desirable family of plants were the *camellias*: of these, we purchased four plants of the double-striped, three of the double white, and three of the double red. We heard of and got drawings of the single white, called by them *chasanqua*, but *Samay* the gardener said, it being a wild Alpine plant, was not in cultivation.

All the *camellias* are called *cha faa*, that is, *tea flower*, probably from resemblance, and the sorts are contradistinguished by the adjectives *houng*, red, *pack*, white, &c. The common single red (*C. Japonica*) is extensively cultivated in pots, few dwelling-houses being destitute of them. As the petals adhere at the base, and are deciduous together, they are repeatedly replaced on the points of the leaf-buds, so long as they retain their form and colour.

When the palace of *Shykinqua* was prepared for the reception of Lord Macartney, the gardens were profusely furnished with flowering plants in pots. But as the embassy arrived later than was expected, many of the *camellias* had shed their flowers. But on the day of his Lordship's arrival the *camellias* were as blooming as ever with borrowed flowers from other quarters!

Constantly industrious and indefatigable as the Chinese florists are in the culture of ornamental plants, they have nothing like (we have lately been told) the vast variety of their favourite *camellia* which are now common in Europe. A view of Loddiges', or Knight's, or Chandler's collections; would throw a Chinese florist into hysterics, and send him home wringing his hands in envious despair!

The list given by Kæmpfer of the *camellias* (*Tsubbaki*) seen by him, are, besides the above mentioned, one with pale flesh-coloured flowers, with white spots; another with double red flowers, the five outer petals large, the inner shorter and plaited, with many stamina degenerating into petals (*Warratah* ?); another with single scarlet flowers, the outer petals heart-shaped. Kæmpfer also mentions the *C. sasanqua*, or, as it is pronounced by the better-informed Chinese, *sancha yu*, that is, *mountain tea oil tree*, an oil being expressed from it, with which they anoint their hair, and the leaves are used for

seasoning food. This plant was brought to Europe by Mr. Haxton, Lord Macartney's gardener. The above out of Kämpfer's list were not known at Canton when we were there in 1794.

The next genus of importance to us was *Magnolia*. Three plants of the *M. conspicua* or YUCKLAN, two of the *M. obovata*, called by us *purpurea*, and one of the *M. fuscata*, were purchased. These are all very common in the gardens about Canton. The two first come into flower there about the middle of February and some time before the leaves are expanded. The *M. pumila* was introduced by Mr. Slater before 1789.

The (*Tokune*) *Azalea sinensis* were eagerly sought. Two species only could be procured; one, the red-flowered, accurately described and figured by Kämpfer, and the lovely white flowering one. A portable plant of each were with some difficulty obtained: the white one, we think, cost five dollars. According to Kämpfer, there are many species or varieties of this beautiful shrub both in Japan and China: he speaks of no less than fourteen bearing different flowers, but they, except the two we found, were not known at Canton. The Chinese *azaleas* are *decandrious*, and, in this respect, differ from their North-American congeners. The sexual system would therefore place them in different classes; but by the natural system they are associated in the same order in which their exterior semblance and habit so plainly indicates they should be. In the absence of both the sexual and natural systems at the time Kämpfer wrote his *Amœnitates Exoticae*, we do not suppose all the plants which he has denominated *Trutnuri* are really *azaleas*, although they may be all belonging to *Rhodoraceae*. Besides, from the facility with which this tribe sport into each other by art, the same variegations may have happened accidentally on the wilds of Mount Sakanosta, or in the gardens of the city of Jedegua in Japan.

We noticed in private houses small branches of the *azalea*, cut from the tree just before the flower-buds open, blooming beautifully in water, and even before they were in flower in the gardens. The Chinese blow many of their flowering shrubs and trees in this manner.

We found three species of *Isora* at Canton, viz. the *coccinea*, *alba*, and *purpurea*. They are all great favourites of the people. The first is called *par excellence* the Canton MOUTAN, and is seen in almost every house; but, being no stranger in British collections, we contented ourselves with buying only single plants of the *alba* and *purpurea*.

There are several species of *Begonia* in China, but they being all under ground when we were there, we learned very few particulars

concerning them. We, however, procured a few tubers of the *B. discolor*, which we brought home. They are called HAITANG by the Chinese.

We met with several very curious *Epidendrums* (as we thought they were) during our stay. One is called MACKLAN, or, as it may be rendered, black lily. This is now the *Cimbidium sinense* of Lindley. The Chinese grow these plants to a very large size by keeping them in large pots among the richest mud-like loam: so placed, the stools become very large, and produce flower stems of great size and height. We saw one magnificent specimen as it was carried along the street to the house of a mandarin to whom it was presented, or by whom it was purchased. The scape was at least five feet high, with flowers rather thinly set from the top nearly to the bottom. Such a specimen, diffusing so fine a scent, the nurseryman told me was worth one hundred dollars, that is, above twenty pounds sterling! and he added that such prices were often given for superlatively fine plants even of the commoner sorts. The STUNLAN, the *Epidendrum ensifolium* of Linnæus, is very common. STSLAN is another beautiful *Epidendrum*, producing a spike of a few but very elegant deep purple flowers. We offered five dollars for a small plant, but which sum was refused. The *Epidendrum* which they grow in baskets for sale is called TULAN, and, probably, is the *Aërides odoratum* of Louriera. We found drawings of several other orchideous plants, but which, not being in cultivation, could not be obtained.

There are a great many plants belonging to the natural order *Malvaceæ* in China. The *Hibiscus rosa chinensis* is everywhere met with, but this was an old acquaintance, and, therefore, neglected. We found, however, the *H. ros. chin. fl. plen. alba*, called by them *Pack-fat-song*, which we brought home.

The MOUTLEE is one of their favourite plants. This is the *Nyctanthus* or *Jasminum sambac* of Linnæus, of which they have several varieties. We purchased one which we were told bore purple flowers; but of this we had no subsequent proof.

A common wild plant called CHOU MOUTLEE, that is, the bastard *mouilles* or *sambac*, from the similarity of scent, is the *Clerodendron fragrans* of Ventenat. This we procured at Macoa, and brought home.

Two herbaceous plants which we purchased for Kæmpferias, called LUCKSTHAM, were brought home, and, after flowering in England, had several names, as *Niobe*, *Hemerocallis*, &c., but are now the *Funkia subcordata et ovata* of Sprengell: they are both hardy. The latter flowers freely, the former less frequently. Our spring is perhaps

too damp for their tubers, which, if taken out of the ground and kept dry for a month or so, might perhaps expedite their flowering in summer.

We got one plant of the HOITONG, the *Cydonia Japonica* of Persoon. This plant had been introduced several years before by Mr. Slater, but repeatedly lost by being treated as a stove plant.

(To be continued.)

Hyde Park Corner, 20th April, 1836.

ON THE DESCENT OF THE SAP.—SIR,—I feel much surprised that, after all the methods you have taken to excite an investigation of the merits of the physiological theory which you have promulgated, that as yet not one of our writers upon this interesting science has taken the least public notice of your remarks. Many reasons might be assigned for deterring individuals like myself from calling in question the validity of your opinions; but no apology can be pleaded by those who, whatever may have been their own personal investigations, have at least joined issue in the opinions of others, and published and inculcated these opinions for the purpose of instructing us in the science of our art. Scarcely has the smallest work emanated from these scientific instructors, that contains not, as a recommendatory set off, a high-flown compliment respecting our stupidity and prejudice, and yet they have allowed the opinions of a practical man, with whom, according to their own showing, we are most apt to identify ourselves, to pass unnoticed and unchallenged, although these opinions have a direct tendency to demolish the whole of that theory which they have inculcated. For myself, I pretend not to possess that intimate acquaintance with the subject which could qualify me for passing a proper judgment; and, indeed, I much doubt if ever I shall arrive at the knowledge of a defined general principle applicable to all cases of vegetable development, since the more I have investigated the phenomena of vegetation, the more have I become convinced that different tribes are regulated in a certain degree by systems as diversified as their nature. Approving, however, of your anxious desire to have your opinions investigated, I venture to make a few remarks and inquiries, confident that you will exercise your accustomed good feeling and indulgence, and give us a farther detail of your views, as at present we possess not sufficient data to pronounce that you are right or wrong.

Waiving minor details, I conceive that the peculiar views you entertain have a reference chiefly to the motion and properties of the sap, and the existence of a newly discovered member named the *indusium* or vital envelope.

After carefully reading your remarks upon the motion of the sap, and your objections to the different theories, I do not perceive that you have advanced any one of your own. You confess that all your experiments have led to negative rather than affirmative conclusions. This is certainly very candid. You say, however, that you do not deny occasional or partial sinkings of the sap. Upon what principle do you then account for these partial sinkings? I really do consider it more philosophical, and more in consonance with the phenomena of organised existence, to admit at once a principle of regularity of movement, than to consider that these wonderful developments are effected by any process bordering upon being fortuitous. You seem to abjure the opinion of the regular descent of the elaborated sap, merely because you cannot account for it upon the general laws of fluids and mechanics. I make little doubt but we shall find, as we become better acquainted with vegetable anatomy, that the flow of the sap takes place in unison with the principles of fluids and mechanics; but shall we on this account come to the conclusion that these laws have any other connexion with organised existence than that of being wholly subservient to its purposes? Admit that vegetables are endowed with a vital principle, and you must allow you are then treating of something vastly superior to a mere machine or the most perfect chemical apparatus. The circumstances connected with ligatures and ringing, to which you frequently refer, go far to confirm a descending as well as an ascending fluid, and that both are in constant operation. If, as some allege, every part of a plant has the power of elaborating and appropriating to itself the necessary supply of sap as it rises from the roots—an opinion in which you seem partly to concur—how comes it that, in the case of ringing, the plant almost invariably attempts to heal up the deficiency by making advances from the upper side, while little or no advances are made from the under side—if it proceed not from an accumulation of sap that has been stopped in its downward course? Here it may be asked, how, upon this principle, there should be any advances at all made from the under side. There is certainly a difficulty in accounting for this at first sight, but it is greatly removed when we think of the abundant proofs we possess, that there is in the vegetable as well as in the animal economy not merely an accommodating principle, enabling plants to suit themselves to circumstances, but a powerful energy ever ready to be put in requisition for the healing of a wound, making good a loss, or maintaining an existence. A host of interesting confirmatory facts might easily be adduced. Besides, we are agreed that, besides the leading channels through which the sap flows, it also is diffused in every direction through the vascular and cellular texture, and,

therefore, though believing that the presence of sap, after being elaborated in the leaf, is necessary to vigorous accretion, there is no anomaly in perceiving a slight advance upwards from the under side of a ringed stem, since we know that the bark possesses in itself an appropriating elaborating principle, as upon removing a piece of bark from one plant, and filling the space accurately with a piece from another of a different variety, although it be destitute of any bud, the wood formed under it in every successive year would be of the same quality as the identical plant from which it was taken.

After mentioning these facts, I would not ask you to believe that the fresh layers of liber and alburnum are formed fortuitously from the descending sap; but I would ask you, granting meantime the full benefit of your *indusium*, if you do not consider that sap necessary to its vigorous development? If not, then I desire to know upon what principle you can account for the facts, that the under side of a ringed stem increases not equally with the upper; that upon making two annular incisions on a stem, and leaving a space between them destitute of a twig or a bud, this space will make most trifling advances either upward or downward; that trees bleed freely in spring before their leaves are expanded, and in the end of autumn, when they are falling or withering; that a twig stripped of its leaves in the growing season, if it does not die, makes no addition to its substance; that a leaf and lateral shoot together, taken from a vine-branch, tend to render the buds in their axil abortive in a succeeding year; and, not to be tedious, that I have witnessed the industrious cottager obtain few tarts from his rhubarb plants this season, from having pulled the leaves too closely in the last? The determination of these points I conceive to be of more importance, as respects the practices of gardening, than the establishment of the indusial membrane. I have as yet had no proofs of its existence so far as my organs of vision are concerned, and, therefore, for the present, I must remain rather sceptical, unless I identify its existence with the inner layer of the liber. Besides, though plausible at first sight, I am not convinced that granting the existence of such a member throws any additional light upon the secret processes of vegetation. I think you must grant that the descending fluid must be present, even upon your own system, to enable the *indusium* to develop the fresh layer of alburnum and liber. Grant this, and we need little more concession. It is true that some represent the regular mutations and accretions of plants as merely accidental, but, abjuring such a system, I see nothing more unphilosophical in supposing that the plant has an inherent property, by virtue of its vital principle, of appropriating a portion of the descending sap to the formation or expansion of what

it contained in embryo, than in supposing that a certain membrane imperceptible to the eye should possess the power of becoming in succession a pulpy, gelatinous mass; then imparting to this mass the properties of organisation, dividing it into liber and alburnum; and, finally, peacefully taking up its abode between them unchanged or self-produced, ready to perform the same operation in the following year.

I fully agree with you, that nothing is produced without its seed or propago, but I conceive there is a difference in treating of a plant being produced from a seed, and holding the necessity that every expansion of that plant should take place in a manner exactly analogous. Grant that vegetation is regulated by a principle of life, and it becomes as much the province of that principle to make an addition annually to the size of a ligneous plant, as it is the province of life in the animal economy to enlarge the size of the members of the body, and change their constituent parts, through means of the nutrition or food which it has received and digested. Almost every gardener is conversant with the fact, that the vital principle is peculiarly active in the inner layer of liber, but he will not trouble himself much respecting your *indusium*, if the knowledge of its modes of operation will not enable him to perform better his different operations. I suppose you would at once admit the descent of the sap, if the tumour above an annular incision were found to contain a simple bland fluid instead of cambium or alburnum; but if such were the fact, I should consider it as a proof that the vital principle was unable to appropriate the food at its disposal to the purpose of additional growth. The fact to which you refer, that, in the case of wounds, the sap which is exuded becomes not cambium, but resin, gum, canker, &c., is no proof that it is impossible the sap should be changed into wood through processes applied to it when circulating in the tubes of an organised being. The appearance which the sap presents when exposed to the atmosphere but proves the existence of disease and the infliction of injury; and to expect in such cases the formation of wood, although in other circumstances it might have become so, would be as inconsistent as to expect to see the blood, flowing from a wound in our own body, becoming converted into bone, muscle, and flesh, because aware that that fluid is the agent employed, by the principle of life, not merely for enlarging these different substances, but continually changing them in their constituent parts. I grant you that we cannot account for the change of sap into alburnum upon any chemical principle, any more than we can account for the mutation of blood into bone; and I would at once deny with you the possibility of its conversion, did you convince me that chemistry

governed and was not subservient to *life*. But if you remain sceptical upon this point, because you cannot account for the phenomena upon chemical principles, I should like to know if you have discovered by the analysis of your *indusium* the constituent parts of liber and alburnum; if in the farinaceous substance of a seed you have ever detected the ligneous consistence of a tree; or, after a seed has been deprived of vitality, you have been competent, by any chemical process you could devise, to effect one of those interesting changes which took place so naturally and yet so wonderfully in every case of healthy germination? My time being quite expired, and I suppose your patience put to a severe test, I must conclude, and remain, &c. &c.

Yours truly, ROBERT FISH.

A FEW OBSERVATIONS ON GARDENERS' SOCIETIES. — SIR, — In looking over the last numbers of the Horticultural Register, I find to my great surprise much valuable space occupied with the establishing of gardeners' societies, which are advocated in very strong terms. Many of your readers regret there is no society of the kind on the western side of the metropolis; it is so, and I believe it is no great loss. But, Sir, I tell you what we have that the writers are not aware of, we have the finest market gardens in the world, where vegetables are grown to astonish every gentleman's gardener who is fortunate enough to see them. Young gardeners brought up in gentlemen's gardens know very little about growing good vegetables; and I believe I may state, with some truth, less about cropping their ground.

The evenings are now getting long, and there will be two or three hours to spare after work in the nurseries. I would advise those young men who may be employed in the different nurseries at the western side of the metropolis to take a walk through the market gardens, and make observations on what they see going forward there.

If they are employed at Knight's, on the King's Road, it will not be far for them to visit the gardens of Mr. Robert Bagley, on the Fulham Road, or Mr. Charles Bagley, at Sands' End; or if employed at Whitley's, on the King's Road, the Messrs. Fitches, of Parsons' Green, might be visited; there they would see such a style of gardening as would truly astonish them. Mr. Alexander Dancer's gardens are close at hand, and also Mr. Robert Matyear's. If at Lee's, of Hammer-smith, let them visit the Fulham fields, as they are called, or any of the extensive gardens that the western side can boast of, it would do more in giving them a proper insight into their business, than if they were members of twenty different gardeners' societies. Young men may be accused of apathy in not coming forward to establish societies, but where are they to get the money? the greater number of them

come out of the country parts of England, Scotland, and Ireland, where they have been receiving very low wages, and out of that they have, in many instances, to pay the gardeners a certain fee. The life of a young gardener is a life of privation: he comes to London, and before he can get employment in a gentleman's garden, it very often happens he has to pay a second fee to the gardener who may employ him. Aye, as much as ten guineas, though he may have paid fifteen guineas before his arrival in London, and all this to qualify him for twelve shillings a week, or at most between twenty-five and thirty or forty pounds a year and his board, the half of which sum he must spend in clothes and washing; where then is the young gardener to get money to keep up gardeners' societies, or what want has he of them, when he can improve himself without them by practical observations. This he can do about London. The periodicals may be amusing and instructive to young men in the country, but they very often contain irrelevant matter. If you were to impress on the minds of young gardeners the importance of visiting the market gardens, and thereby improving themselves, you would confer a lasting benefit on them, much more than by advocating gardeners' societies so strongly, and could fill up the space, which I consider is now entirely wasted, with much better and more interesting articles in your (but for them) valuable Register.

I remain yours, &c.,

J. H. BURNHAM.

Fulham, March 14, 1836.

The foregoing letter was received too late for insertion in our last, but we give it a place in the present, not, however, because the writer "throws cold water" on the projected formation of a gardeners' society on the west side of London, but because he advises a mode of improvement easily accessible to all. We lately took an opportunity of speaking in the highest terms of the excellent system of market gardening prosecuted by the very persons to whom Mr. B. alludes, and we fully agree with him in every thing he states commendatory of their practice. That a knowledge of *market-gardening* cannot be attained in a nobleman's or gentleman's place in any of the three kingdoms is perfectly true; and because the two systems are widely different: in the one, unbounded supplies are required in any or in every day of the year, in the other, a very limited, but daily supply must be had, and often by very limited means. The market gardener has no objection to dispose of the *whole* of any *one crop* in one market day; but the private gardener neither can nor must he do this, for otherwise the green-larder would be very irregularly supplied. The *manner* of cultivation pursued in market gardens is, however, well worthy imitation

everywhere; and we unite with Mr. B. in saying to all young gardeners—*look about you*. On their behalf we have a request to make, and we know of no one to propose it to more able to comply than Mr. B. himself; and that is to give a sketch of their practice in raising any one crop; or, what would be better, giving the rotation of cropping on any given quarter or compartment of a market garden, for the space of five, seven, nine, or eleven years, or for whatever term includes their usual round of successional cropping.

Mr. B. will excuse this direct appeal to him; and as he appears to be a “ready scribe,” we are sure that the task will not be difficult, nor any way disagreeable to him.—*Ed.*

THE IMPORTANCE OF THE STUDY OF BOTANY TO MEDICINE. By C. JOHNSTON, Lecturer on Botany at Guy's Hospital. (From the Analyst.)—Reverting to the state of the medical profession some twenty or thirty years back, and the ignorance of too many of its self-elected practitioners of the most essential requisites for a pretender to the healing art—a knowledge of the anatomy and physiology of the human frame, and the symptoms and treatment of the various diseases by which its functions are liable to be interrupted and impaired, the denizen of the present time has much reason to congratulate himself upon the revolution which it has undergone since that period—a revolution that has contributed towards rendering even the uncertain tenure of mortality less precarious, by securing to him the advice and assistance of persons expressly qualified by their education for that purpose. The impudent system of quackery, so often held up to ridicule at the present day, was certainly not without its parallel formerly in the so called medical profession, when, after a longer or shorter period spent in pounding and compounding, the capability of administering both simples and compounds seemed naturally to follow. The lengthened and important course of studies required at the present day, does not wholly preclude the possibility of a man of inferior talent entering the profession; but we have still the satisfaction of knowing that a complete blockhead has not the same opportunity that he once had of placing himself in competition with the man of ability and liberal education.

Of the various branches that bear upon medical science, Botany seems to have been the most backward in arresting the attention of those intrusted with the superintendence of medical education. The improvement of this latter has been progressive; and the impression of the high importance of those studies, that led to a knowledge of the structure and functions of the animal body, of the practice of medicine, of chemistry, and materia medica, caused them, under the then existing circumstances, to precede that of botany. Hence, indeed,

long after the establishment of schools for the tuition and preparation of candidates for medical licence, it continued to be considered as a mere adjunct of the latter class, *materia medica*. As such it was confined in this country, at least, to the notice of the plants of the pharmacopœia; and as regarded his progress in a science now so complex, the student of medicine, thus tutored, resembled the preacher who could *read* but only in his own book. He might have learned to know the drowsy poppy of the garden, perhaps even to trace its relation with the gaudier crimson tenants of the corn-field challenger, the drastic hellebore, the foxglove, night-shade, and conium of his native land; but was rarely capable of extending his lore to the more distant affinities which characterise the vegetation of a different clime; and therefore ill-calculated to avail himself of their valuable, or to avoid their baneful, properties: still less to add, by observation and experiment, to the most useful department of that science, to a knowledge of which he would, probably, pretend.

Among the several causes which have led to a more extended application of botany to the purposes of medicine, the establishment of the Medico Botanical Society may certainly lay considerable claim to public notice. During its career, the attention of a large portion of the junior members and aspirants of the profession has been directed by it to the importance of a subject which, but for their attendance upon its meetings, would, probably, have remained a matter of indifference to them. I say of indifference—because the extensive facilities afforded to the mere mechanical practitioner, and of such there are unfortunately still too many, by the vast commercial machinery of this ever active and enterprising nation, has rendered him, in a great measure, independent of his own resources. He gives an order to his druggist, depending upon the latter for the correctness of its execution; and as to any thing farther, why—as an unworthy disciple of Esculapius not long since replied to a friend of mine, who ventured to hint that too violent medicine had been administered to an infant—“There is a book called the pharmacopœia, in which the art of compounding medicines for every disorder, and even the proportionate doses for every age, are duly set down, I always consult that book before I prescribe, and therefore, Madam, cannot be under a mistake.” So that, really, with a good druggist, named bottles and jars, and Thompson’s *Dispensatory* upon his counter, such a man may do a good stroke of business, as the mercantile phrase has it, with very little judgment, but a great deal of satisfaction—to himself. For the sake of their patients, I fear very few such attend here; for they would learn, at least, that drugs will vary very greatly in quality—that the

bark, the root, the herb of the same species, gathered at different seasons, do not contain the same principles ; this, at one period, is an active medicine, at another, next to useless ; and besides, if chicanery will practise upon the immediate necessities of life, the commerce of medicine is not likely to be wholly free from its impositions.

Experience has shown that not only the imported articles of *materia medica*, but even those of home growth, are often the vehicles of fraud that renders negative, if it does not totally subvert, the intentions of the adviser. The leaves of the senna are mingled with those of several other plants, of less valuable and of deleterious quality ; the lithontriptic and diuretic properties of the *uva-ursi*, are supplanted by the simple astringency of the *vaccin. vit. id.* : and even the bark of the tree of life itself—the highly prized *cinchona*—is vilified, and its restorative virtues abused, by the cupidity of the fraudulent and grasping trader, who scruples not to impose upon his ignorant customers that of other trees of inferior worth. Now even in the state in which these and numerous other vegetable substances are submitted to the inspection of the faculty, a knowledge of botany will often afford a test of no small importance in the choice of an article which a person proposes to prescribe and administer, where his fortune, and, what is more valuable to a medical man, his reputation, is at stake. Even a very few years since, how few in this country were possessed of a sufficient share of that knowledge for such an application of it. Men who had risen to the highest rank in their profession, scarce knew a nettle from a crowfoot ; and the capability of not confounding a mullein with a foxglove, seemed almost a miraculous stretch of botanical acquirement for a doctor, to one who had heard, in a very learned assembly too, a yellow gentian, in full flower, hailed as a splendid specimen of *digitalis*. Such ignorance, however, was pardonable in the accomplished who betrayed it—in one educated at a period in which the utility of botany was not even dreamed of, as a necessary part of the study for a physician. Now, however, who would be justified in pleading apology for overlooking or slighting the advantages it offers ? Surely no one is ignorant that the structure of the vegetable frame is determined by laws as absolute, as invariable in their action, when left to the guidance of nature, as are those which govern the development of the various species of animal existence ; and as the mighty genius of comparative anatomy, the highly talented and lamented Cuvier, could, by his magic touch, bid the disunited and scattered bones of a thousand different individuals arrange in the original order of the frames they once gave form to and supported ; so the botanist, practiced in the intricate lore of vegetable anatomy and

physiology, reads often, in the venation of a leaf, or the texture of a bark, the character of the plant to which it belonged, in opposition to that of others whose products may be mingled with them.

Had he in addition to the structure and economy of the more highly organised plants, traced that of the descending series to the lowest verge of vegetable vitality, and observed the varied forms of both, such circumstances would not be devoid of utility; because the presence of certain tribes of plants indicate the kind of soil or rock to which they are invariably found attached. Plants are also geographically distributed; the chief habitat of the *Ericæ* is in the South of Africa. To the same station the pelargoniums and mesembryanthemums belong; the whole of the aloes is also found there except one in the West Indies. In South America the cacti prevail, and oaks and magnolias embellish the northern latitudes of that continent. Of the roses, not a single indigenous species is known either in South America or Africa. Other natural groups and their species are found only at particular elevations above the level of the ocean. And though some of the epiphytic lichens are found to be indifferent to temperature, others are only capable of existing at a certain mean, and their presence, therefore, upon the dried bark would be indicative of the natural site of the tree that produced it. We are yet, however, but as children in regard to our knowledge of the mutual dependence of organic beings upon each other; and still more so when we view them in connection with the complicated chemical and mechanical agency with which their existence is amalgamated.

SOUTH LONDON FLORICULTURAL SOCIETY.—An exhibition of flowers, flowering shrubs, and fruit, by this Society, took place on Thursday, the 7th April, at the Horns Tavern, Kennington; and although the weather was so extremely unfavourable, the supply of specimens was abundant and beautiful beyond description. Most of the eminent growers and amateurs contributed largely; amongst others, the names of Messrs. Young of Epsom, Gaines, Catleugh, Chandler, &c., stand pre-eminent: in fact, we are fully borne out by the unanimous opinion of the meeting, that the display was equal to anything of the kind ever seen. The exhibition was continued in the evening, and a lecture was delivered by Mr. Johnston, lecturer on botany at Guy's Hospital. The attendance was highly respectable and numerous. The chair was taken by Earl Stanhope, the president, for the first time since his election to that office. The lecturer took a general view of the nature and growth of flowers and plants, describing minutely their internal and external formation and arrangements, their properties, and the manner of their forming and depositing their

seed. He adverted to the manner of their classification and arrangement by the older botanists, as compared with the mode and manner of Linnæus, whose different orders he fully displayed. The lecture gave the greatest satisfaction to the meeting, who only regretted that want of time compelled Mr. Johnston to abridge it. At its close, his Lordship addressed the meeting, stating the gratification it afforded him of presiding over a society of that description, complimenting the ordinary chairman (Mr. Stiff) and the committee on the unprecedented success which had attended their exertions, and assuring them that he should be most anxious to support and promote their interests; and concluded with announcing that their other shows would take place at the Surrey Zoological Gardens, in the months of June, July, and September, when, from the number of influential growers and amateurs who have enrolled themselves members, it is confidently expected they will excel any thing of the kind yet produced.

EXHIBITORS:—Messrs. Harding, Gaines, Fairbairn, Catleugh, Hidolph, Saddlier, Clark, Chandler, Iliff, Laycock, Love, Lidgard, Hill, Conway, Redding, gardener to Mrs. Marryatt, Wimbledon House; Smeë, Buchanan, Dickson, Bowler, Cooper, Young of Epsom, Rogers, Young, and Little. Prizes were awarded to Harding for auriculas; to Dickson for best seedling ditto; Harding for polyanthus; to Lowe for hyacinths; to Chandler for miscellanies; Young of Epsom for best specimen plant; Saddlier for best pears, and Conway for cucumbers. Extra prizes to Redding for a fine specimen plant; Catleugh for geraniums; Little for hyacinths, and Mr. Lowe for best bulbous plants.

SHROPSHIRE AND NORTH WALES NATURAL HISTORY SOCIETY. (From the Analyst.)—The first general meeting of the members of this Society was held in the temporary Town-hall, Shrewsbury, in November last, and was attended by a numerous assemblage of the rank and respectability of the county, who evinced the deepest interest in the proceedings.

The president (the Venerable Samuel Butler, D. D. F. R. S. Archdeacon of Derby) opened the business of the day by delivering the following powerful Address:—

“The most important agent in the natural world is light, which, with its concomitant, heat, sets in motion all the animal and vegetable world, arrays the whole creation in its variety of gorgeous hues, vivifies the dormant seeds of plants, and causes even inert matter to assume new combinations and new affinities, and to ferment, as it were, with the germ of vitality. What light is to the material, knowledge is to the intellectual, world. Nay, we even use the word metaphorically,

when speaking of the operations of the mind. But, as in the case of inert matter, some fermentation takes place before it assumes a more beautiful arrangement in a crystallised or prismatic form, so, in that of mental improvement, the first rays of light which are let in upon the uncultivated mind are apt to cause a peculiar commotion upon it. They act upon it as the Spirit that moved on the face of the chaotic deep, and do not bring the confused and indigested mass into order without a strange and often a violent perturbation. Hence we shall find that, whenever a sudden and vehement impulse is given to the operations of the mind, men become restless and self-willed. In their desire to advance in the pursuit of objects heretofore unknown to them, they are hurried forward by a tumult of impatience and delight; and in their eagerness to outstrip their teachers, they rush impetuously to the goal, they overlook or overleap many previous necessary conclusions, and, mistaking the first rays of light which beam on their understandings for the brightness of meridian day, they become filled with self-sufficiency and self-will, the two greatest obstacles to philosophical investigation and intellectual improvement. These observations appear to me not inapplicable to the present moment. There is a great, a general movement in advance throughout the civilised world, and such an impulse cannot be given to men's minds without important results, nor without considerable agitation. Mankind may be considered at present as under a sort of moral and intellectual ferment, from the influence of the first beams of knowledge shining on their minds, and rousing a confused and inert mass into action; and before any organised or well-regulated arrangement can take place, we must expect the smooth and the rough, the cold and hot, the moist and dry, the dense and rare, to come into collision, and contend with each other for the mastery. This agitation cannot at once subside, and while it lasts we can look for little actual advancement in science; but when it becomes composed and arranged, just as in the defecation of any other fermentive process, we may expect the happiest effects.

"Prejudice and presumption are so closely allied to ignorance, that, where the former exist, we may always expect to find the latter, and they are the greatest foes to sound philosophy and scientific improvement. We may observe this on all occasions, and not least in the attacks which have been made, by mistaken zeal, upon the new science of geology. For my own part, I do not see how the scriptural account of the creation is more impugned or invalidated by the inquiries or discoveries of geologists in the present age, than it was, only two centuries ago, by those of Galileo, who, in that enlightened age, suffered the penalty of a long imprisonment, and nearly incurred the

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severer torments of death at the stake, for asserting those truths which no man thinks now of denying, and which have been confirmed and established by the still more important discoveries of our own immortal Newton. That most able and highly-gifted individual who now adorns the University of Cambridge, and that college in it which has to boast the names of two of the greatest philosophers of any age or country—for what can be greater than those of Bacon and Newton?—and whose own name, hereafter, will be added to a list of worthies unexampled in the annals of science, and claiming the admiration of the latest posterity: he, I say, who has made the geology of this country, in particular, the object of his special attention—and after this description of him it is needless to add the name of Professor Sedgwick—in that matchless and profound discourse which he has published on the studies of the University—a work which, in a small compass, contains volumes; and which can never be too much read or too seriously reflected on—has abundantly and unanswerably replied to all such objections. It will never be found that real science is at variance with scriptural truth. It may help us to a better and clearer interpretation of those truths which are recorded in scripture, but never will it impugn the sacred oracles or promote the cause of irreligion or infidelity. If it enlarges our views of this wonderful creation; if it enables us more clearly to understand the mechanism of the world we live in, and the admirable contrivances for the preservation of the creatures which inhabit it, and the unerring laws by which the worlds around us are moved, and governed, and retained in their several orbits, or in their dependent systems; it can only lead us to contemplate with more reverential awe the inconceivable power and majesty of that Infinite and Almighty Being who called them into existence by his single fiat, 'who spake the word and they were made, who commanded and it stood fast.'

"With these views, then, let us approach the great book of creation, and apply ourselves to study its pages with feelings of gratitude and veneration towards Him who formed it. Of love for the goodness, of reverence for the power, of awe for the majesty, of admiration for the wisdom displayed in all his works, of thankfulness for our own creation, for our preservation, and for all the blessings of this life; and let us remember that this world is but a passage to another, and that natural religion is but the portal by which we may approach to that which is revealed."

ANSWER TO "A SUBSCRIBER FROM THE COMMENCEMENT."

—We would advise that the whole area within the walls be first trenched fifteen inches deep, laying the surface level. When all the

largest stones (if any) are picked off, cover the ground with a good coat of dung, and another composed of small chalk, marl, loam, or earth of any kind within reach. The thicker these materials are laid on and digged in, the richer the future service of the ground will be, either for the growth of culinary vegetables or fruit trees. If only a moderate quantity of loam or mild clay be procurable it should be chiefly bestowed on the borders intended for wall-fruit trees. It should be particularly kept in mind that, on such a deep subsoil of gravel, every exertion should be made to render the garden immediately productive, and this can only be done by making the gravelly surface, necessarily made by the operation of trenching, as rich as possible. Gradual amelioration will be made in the course of years; but a substantial foundation should be laid at first.

When the whole area is thus trenched, enriched, digged and levelled, the next thing is laying out the walks and quarters. A walk four feet wide should encompass the whole at the distance of twelve feet from the wall; in order to correspond with the height of the wall; but which we must remark is two feet higher than it need have been for so small a garden. If desirable the garden may be divided into quarters by walks of the same width crossing each other at right angles in the middle of the plot.

The South and West aspects of the walls may be planted with peaches, nectarines, and vines. Of the two former, dwarfs may be planted at fifteen feet distances, with standards or riders between each couple, to occupy the upper part of the wall. The East and North aspects should be planted with pears, plums, and morella cherries. The first and last at eighteen feet distances, and the second at about twelve feet apart from each other.

The best peaches for such a garden are the Early Admirable, Early Galland, French Mignon, Violet Hative, Noblesse, Royal George, and Late Admirable. The best Nectarines are the Elruge, Claremont, Roman, Newington, and Peterborough. The most useful pears are the Petit Muscat, Sucre Vert, Jargonelle, Bon Chretien d'Été, Autumn Bergamot, Swan's Egg, White Beurré, Brown Beurré, Gansel's Bergamot, Marie Louise, St. Germain, Duchesse d'Angouleme, Crassane, Colmar, Chaumontelle, and Beurré Diel. The best Plums are the Jaun Hative, Early Primordian, Morocco, Early Orleans, Fotheringham, Green Gage, Orleans, La Royale, Coe's Golden Drop, and Magnum Bonum. If a choice of materials can be had for compounding fruit borders, see what has been advanced on this subject in our Number for October 1835. And as to the manner of planting and different modes of training fruit-trees round the margins of Kitchen-garden quarters, see the two last Numbers of the Register.

Of Gooseberries we do not know any better than the Warrington; but as there are a few others which come in about the same time, we may just name them:—Brundet's Atlas, Farmer's Roaring Lion, Mathew's Alexander, Tillotson's Seedling, Pitmaston Green Gage, and Walnut Green.

The Muscat of Alexandria grape is altogether unfit for a greenhouse; nor can any treatment it may have in such a place ever bring it to perfection; because the high temperature it requires at the time the plants are housed would ruin the latter. The other *musk* flavoured grapes which would have a better chance of ripening in the greenhouse, are the White, Black, and Grizzly Frogtiniacs, or Frontinans as they are now called. The attendance required by grape vines depends on the manner they are pruned and trained: but they certainly need looking over twice in the week. The expense of fuel it is impossible to estimate; because that depends on the state of the weather, and the kind of fuel employed. Say half a bushel of coals per *diem*.—*Ed.*

NOTICES OF BOTANICAL PUBLICATIONS.

EDWARDS'S BOTANICAL REGISTER, continued by Dr. Lindley. The April number contains:—

1. *Angræcum caudatum*. Long-tailed Angræcum. A most remarkable new species imported from Sierra Leone by Messrs. Loddiges. Like other *orchideæ*, the flowers are of a remarkable shape, and having spurs nine inches long. The plant is difficult of culture, and is yet very rare in the country.

2. *Kennedia Stirlingi*. Sir James Stirling's Kennedy. A graceful green-house trailing plant, native of the Swan River. The leaves are broad and pale green, fringed with weak hairs. The flowers are scarlet, blooming in pairs, and appear in April.

3. *Cratægus microcarpa*. Small fruited Thorn. It is a native of North America, and perfectly hardy. Its value as an ornamental plant consists in the neatness of its foliage and beauty of its scarlet fruit. As the genus *Cratægus* has been but little noticed by botanists, Dr. Lindley announces that he intends figuring the whole of them (*i. e.* foliage and fruit) in the future numbers of the Botanical Register, as a genus of plants deserving of more notice than has hitherto been bestowed on them.

4. *Cratægus heterophylla*. Various-leaved Hawthorn. This is another ornamental thorn which is well worthy a place in every collection; it is an abundant flowerer, and, like its congeners, bears a profusion of scarlet haws in the autumn.

5. *Maxillaria rufescens*. Brownish Maxillaria. A native of Trinidad, imported by Mr. Lowe, of Clapton. Was first flowered at the Duke of Devonshire's, at Chatsworth, in 1834, and, since, in other collections. It is the same species which is called by some *M. fucata*.

6. *Godetia lepida*. Smart Godetia. A pretty new annual found in California by Mr. Douglas, and was raised in the garden of the Horticultural Society in 1835. This plant was formerly ranked among the *Oenotheras* till separated and made a new genus by Spach, with several other new genera from the same old genus. Dr. L. thought that several of Spach's new genera were merely fanciful, but admitted that that botanist had valid reasons for separating the present plant, and, therefore, has adopted his generic name *Godetia*.

7. *Oxyura chrysanthemoides*. Ox-eye-like Oxyura. A plant belonging to *Compositæ*, and made a new genus by M. De Candolle, and by him placed "in the SUBDIVISION *Madiæ*, of the DIVISION *Galinsogæ*, of the SUBTRIBE *Helleniæ*, of the TRIBE *Senecionideæ*, of his first SERIES *Tubulifloræ*, which nearly answers to the *Corymbifera* of Jussieu." [!] It has been said that the more the natural orders of plants are divided, the easier the study of the science will be. Here then we have an instance of SUPRA-SUB-DIVISION, which cannot fail to lead the student to the proper point of the system. This plant has very much the aspect of *chrysanthemum coronarium*. It is a hardy annual, flowering in August and September, and ripens seeds in abundance.

SWEET'S BRITISH FLOWER-GARDEN, continued by Professor Don. The April number contains:—

1. *Nemophila insignis*. Opposite-leaved Nemophila. A very pretty annual, native of California, whence it was sent to the Horticultural Society, and raised in the garden of that establishment. The genus was established by Nuttall, who found the original species, *N. phacelioides*, near Fort Smith, on the Arkansas.

2. *Zenobia speciosa*. Showy Zenobia. A beautiful hardy American border-plant, where it well deserves a place among the *Kalmias*, *Ledums*, &c., from the same quarter of the world. It has been known in this country for nearly forty years, and described as *Andromeda speciosa*, or *A. cassinefolia*, or *A. pulverulenta*. According to Sprengel, it is nearly allied to *Enkianthus* of Loureiro, but is now established as above by Professor Don, in his second subtribe *Andromedeæ*, of the natural order *Ericaceæ*.

3. *Rhododendron flavum*; var. *coronarium*. Garland Rosebay. This splendid shrub was called *Azalea pontica* by Linnæus and many of his followers, and *Chamærhodendros pontica* by Tournefort. It

has been lately introduced into this country by Mr. Knight, of the King's Road, Chelsea, along with many others of the same tribe. This is said to be the handsomest of the yellow-flowered kinds.

4. *Campanula Loreyi*. Lorey's Bell-flower. A most elegant and showy annual of easy culture, thriving in almost any kind of soil, where it will continue itself by shedding seed. It is a native of Italy, and has been in our collections about ten years. There are two varieties.

PAXTON'S MAGAZINE OF BOTANY for April contains:—

1. *Eschscholtzia crocea*. Saffron-flowered Eschscholtzia. A more showy species than the *E. Californica*. It may be propagated by divisions, or, which is better, by seed, sown as soon as ripe, on a warm spot, where the seedlings will stand the winter without protection.

2. *Ipomea Horsfallia*. Mrs. Horsfall's Ipomea. The seeds of this elegant plant were received either from India or Africa. It is a climber, and is covered in autumn with a profusion of red flowers. It belongs to *Convolvulaceæ*.

3. *Musa Cavendishia*. The Duke of Devonshire's Banana. This interesting new species of Musa is said to be a native of China, and it is supposed that there is only one other plant of it in Europe. Mr. Paxton has been fortunate in fruiting it at Chatsworth; and, from the very full account given by Mr. P., it promises to be a valuable addition to our stock of tropical fruits. The other species of Musa which have been long in our collections, and frequently fruited, are such majestic plants, that very few stoves are lofty enough to allow of their rising to their full and fruiting height. But this new acquisition yields its fruit when only a few feet high, so that any common-sized stove may contain as many plants as will yield a supply of fruit for the table for several months. Mr. P. has given in this number not only an accurate coloured figure of the flowers and fruit of the *M. Cavendishia*, but has added an interesting history of the other species heretofore known in European collections. The oldest one of our stoves is the *M. paradisiaca* of the East Indies, but the commonest cultivated species in the West Indies is the *M. sapientum* or banana. Shady walks of these are attached to every plantation and to every house or cottage in Jamaica. As the banana is perennial, and ever throwing up a succession of young stems, some one or other of the plants are yielding fruit the whole year round, and this is very often the chief part of the food of the owner and his family. Three dozen of the fruit are sufficient to serve one man a whole week instead of bread, and will support him in warm countries much better. When boiled or roasted, they are used in the place of bread, and eaten with fish or salt meat. When ripe, tarts are made of them, or the fruit is sliced and fried with

butter, or dried and preserved as a sweetmeat, or converted into an excellent marmalade. The young shoots are eaten as a delicate vegetable, and the old stems when shredded or chopped up are excellent manger meat for cattle.

From the foregoing remarks, it will appear that the banana is not, even when mature, a rich luscious fruit like the peach, or mango, or pine-apple, but rather resembles in quality and consistence some of our beurré pears. Those we have partaken of in India, we thought very little, if at all, superior to the *Psidium pyrifera*. But, as we have a natural antipathy to all sweet fruits, our judgment is not to be relied on. The fruit of the banana, however, when produced in this country, and whether appearing in the second course at table or in the dessert, will always be considered as a rare luxury.

This number of the "Magazine of Botany" contains also Hints on the *Illicium floridanum*; Culture of the *Ixia* tribe; Treatment of *Rhododendron arboreum*; Hints on *Thunbergia*, of which nine species are noticed; together with Remarks on *Astrapæa*;—all very valuable information for the cultivator of exotic plants.

SMITH'S FLORIST'S MAGAZINE

Contains the *Anemoneflora* and *Rosa Mundi Camellias*; *Rhododendron campanulatum*, a fine Nepalese species introduced by Dr. Wallich; the Miss Miller and the Emperor of China Picotees; and the Solon and Esther Tulips. The letter-press accompanying these beautiful figures is full of the necessary information respecting their cultivation and history.

CALENDARIAL MEMORANDA FOR MAY.

KITCHEN GARDEN.—Continue to sow once a fortnight succession crops of Knight's marrowfat peas and the most desirable sorts of common beans. Earth up and stick the early-sown crops of those which are sufficiently advanced.

Dwarf Kidney Beans may be sown at least twice in this month, and, about the middle, sow a full crop of the runner kinds. If either dwarfs or runners have been sown in boxes or frames for transplanting, they may be transplanted into drills about the 15th.

Cauliflowers.—Those under hand-glasses may be henceforth fully exposed; the earth drawn to form basins round the plants, to admit of them being supplied with manured water, to increase the size of the heads. Towards the end of the month another seed-bed may be sown to raise plants for autumn and winter service.

Broccoli.—If any early-sown seedlings be fit to transplant, it may now be done. Deep and rich ground is required, in order to have heads of good size. It is impossible to have fine broccoli on poor land, and, to have strong stocky plants, it is a good plan to give them a month's growth in a second nursery-bed before they are put out for good. A small bed of the Siberian sort may be sown towards the end for the latest next spring crop. The middle of the month is a good season to sow the green and early purple Cape sorts, and Grainge's early white, to come in during the autumn. At the end, sow the green close-headed for winter use.

Carrots.—A moderate-sized piece of this vegetable should be sown in this month for drawing young in summer. The principal crops will require thinning towards the end, and must be kept constantly free from weeds.

Spinach.—Sow once a fortnight.

Onions.—Sow the silver-skinned for drawing young for salads, and a bed or two thick for picklers. Thin and weed the principal crop sown in March. If thinned by the hoe, the soil should not be deeply loosened, as onions always bulb better on firm than on loose ground.

Cabbage and *savoy*s for autumn use should now be planted out, and a trench or two may be got ready for the first crop of *celery*.

Radish of different varieties, *lettuces* and small salad herbs may be sown twice in the month, and, about the end, a small bed of the green-curled *endive*. The different sorts of lettuce should be frequently transplanted from former sowings to secure a constant supply.

Turnip.—Sow another piece of the early Dutch or stone sorts, to succeed those sown last month. Turnips for genteel tables should always be young; they are in the highest perfection, as well in consistence as flavour, when about two and a half inches in diameter. The white Norfolk, an agricultural variety, are seldom seen in gardens, but they are highly valued by the cook for their superior sweetness, if not too large.

Beet.—The different sorts will require thinning, leaving the red ten inches apart, the green and white somewhat closer.

Potatoes.—In some families, young potatoes are required all the year round. The smallest early varieties, such as the Early Frame and Early Batson's, are the most suitable sorts, because of these acquiring a degree of wholesome maturity when very small. A few may be therefore put in from time to time, up to the end of July, if the old tubers can be kept dormant so long. We have known the earliest hot-bed potato plants, which were gradually robbed of their first tubers as they became fit for use, continue to produce others

even till the end of summer, and not only from the original roots, but from the young tubers themselves, without the assistance of either green stem or leaf!

Cucumbers, Vegetable Marrow, and Gourds.—It is presumed where hot-bed forcing is carried on, that the seeds of these several exotics have been already raised and potted off in readiness to be ridged out about the middle of the month. For the mode of management, we may refer back to what appears in our calendar for May last; but, to save trouble, we may here repeat that trenches or square pits, two feet wide and as much in depth, are filled with well-prepared stable dung beaten pretty compactly together, and immediately covering it with about eight inches of dry rich compost. As soon as the heat has risen and warmed the compost, place hand-glasses three feet apart along the middle of the trench or rank of pits, and under each a pot of plants is placed a little deeper in the compost than the depth of the pots. The plants are carefully turned out of the pots without disturbing the ball of roots, and the compost is pressed close round and partly over the ball, so as to press the stems a little outwards. A little water is then given and the glasses put on; they are covered and shaded in the day till they have taken fresh root; after which the plants only require a little fresh air every day by raising the south front of the glasses on a brickbat, and shut down at night.

As this is rather a late spring, it should be considered that the sowings of the two former months will be likely to come in too much together, and, therefore, the successions of this month should be somewhat delayed. The state of the preceding crops, however, will always enable the sower to hit the most proper time.

Fruit Trees.—All trained fruit-trees should be carefully looked over in this month; supernumerary and all misplaced shoots should be rubbed off before gaining strength to exhaust unnecessarily the juices of the tree; and distorted leaves (the work either of insects or mildew) should be picked off and buried or otherwise destroyed. Apricots, peaches, and nectarines particularly stand in need of this manipulation. The symmetry and perfect health of the tree depends entirely on the regulation of the growth, which can only be made in this and the next month. Although this care be usually only bestowed on the wall-fruit just named, yet all other trained trees may be much improved by such regulation at this season.

Whatever covering may have been employed for the protection of the bloom should not be wholly removed till about the 20th of the month; and if the weather be then dry and warm, frequent sprinklings, or washings rather, with water or soap-suds, will be beneficial to fruit-

trees, whether on walls or otherwise. Wherever slugs are expected to be injurious, as on strawberry-beds, &c., they should now be well drenched with lime-water. This repeated two or three times at intervals of a few days, will banish them entirely.

No memoranda need be put down concerning forced fruits, whether in hot-beds or in houses. These require unceasing vigilance, and it is but rarely indeed that anything relative to them is forgotten by the manager.

FLOWER GARDEN.—Sow successions of hardy annuals and biennials, and thin and transplant some of those sown in March. Tender annuals, dahlias, &c., lately potted and in frames, must be guarded by mats against the cold of nights, and shaded, till they are well rooted, from the sun by day. Such as are intended to be put out in the open air should be gradually hardened by raising the lights before they are finally put in their summer stations at the end of the month. For the particular management of the Dahlia, see our last number, page 150. All stage and bed flowers now require attention in shading, propping, and defending from insects. Carnation seed may be sown. A few ranunculus roots may be planted to flower in August, and new beds of violets made. Greenhouse plants may be gradually shifted, preparatory to their being set abroad, about the 25th. Camellias should be kept in a higher temperature during this month, in order to throw them into a flowering state. Cuttings of heaths and other ornamental plants may now be put in, and rose-trees cut back to obtain a later bloom.

REMARKS ON THE WEATHER.

EVER since the date of our last remarks the weather has continued exceedingly changeable and accompanied with a good deal of rain. Luckily no very intense night frosts have occurred to hurt the blossoms of wall-trees, or those of standard plums and pears. In the neighbourhood of London, plums appeared to be fully blown about the 17th, and pears, particularly the earliest sorts, are now profusely covered with flowers. The frequent showers by which the opening buds are drenched will serve to check the increase of insects, and very likely assist in setting the fruit; and, should no sharp frost occur, the present prospect of a crop is favourable. Apricots on walls, whether covered or not, have set well; and the present appearance of fruit-trees in general (except those that bore heavy crops last year) look promisingly.

The season is backward, and there is now a great want of greens of all kinds except spinach. A few spring cabbages have been brought to market, but they are very small. Coleworts are also extremely scarce.

April 24th, 1836.

PAXTON'S HORTICULTURAL REGISTER,

JUNE, 1836.

HORTICULTURE.

ON HEATING HOTBEDS BY HOT WATER INSTEAD OF STABLE DUNG.

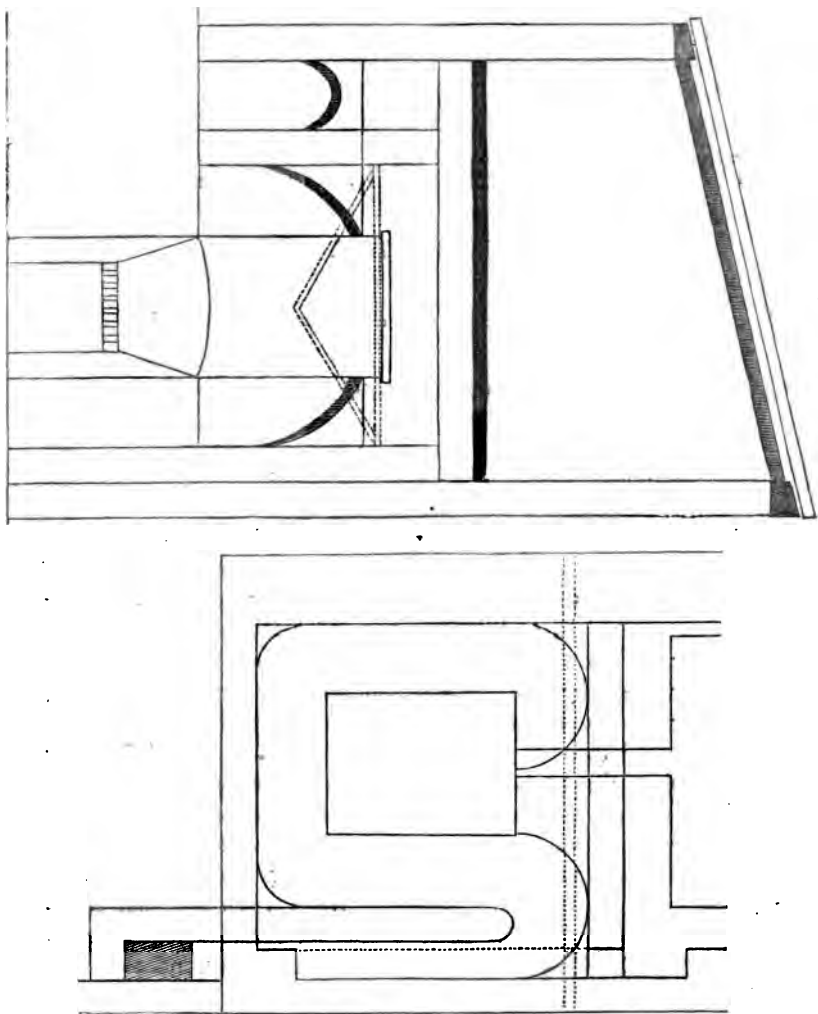
MANY proprietors of gardens and lovers of gardening are obliged to forego many of the early products of the garden, from the difficulty of obtaining stable dung enough for their ordinary purposes. Other fermenting materials, as leaves or tanners' bark, are equally inconvenient or expensive to procure; and, therefore, it has been long anxiously wished, by many persons, that some substitute for hot dung could be applied in the culture of cucumbers and melons.

In our April number, page 133, our correspondent A. Z. begs for information on this point; and, luckily, another valued correspondent put it in our power to give a description of a pit for cucumbers and melons heated by hot water, and which had been successfully worked for several years, adding a promise, that if any further information were required, he would willingly give it. On behalf of our correspondent A. Z., we begged of R. G. to give us a plan and section of his pit, and which he has been kind enough to hand to us for publication.

The general description of the length, width, and manner of fitting the interior, may be learned by turning back to page 134, with this explanation, that the boiler is surrounded by a flue; and when it is said that "*a four-inch pipe is carried just long enough to go through the back flue and brick-work,*" the writer means, through the flue and brick-work which surrounds the inner end of the boiler. This

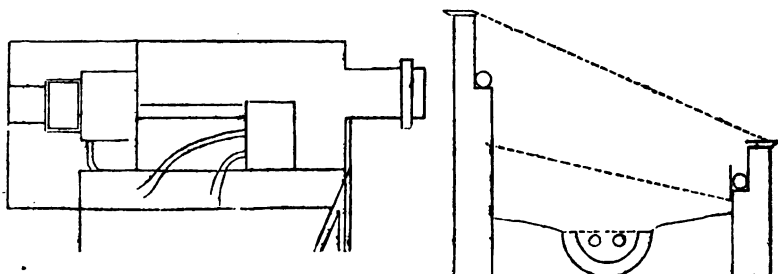
202 SECTIONS AND DESCRIPTIONS OF HOTBED PITS.

will be better understood by referring to the annexed plan and section of the west end of R. G.'s pit.



Notwithstanding this pit and apparatus answers the purpose, Mr. R. G. thinks, and we agree with him, that it is capable of being much simplified; and, at the instant we were writing these remarks, we received from a friend the plan of another pit, erected for a similar purpose, by Mr. Weekes, for Sir Francis Shuckborough, of Chelsea.

In this, there is no iron pan for holding water under the bed, but a brick-work semicircular trough, lined with the best water-tight composition. In this trough, which extends the whole length of the pit, a loop of two-inch hot-water pipe is laid, being fed from an elevated cistern above the boiler, as seen in the annexed sections. The purpose of the elevated cistern is to obtain another circulation of hot water to warm the air above the plants, when necessary, by pipes laid on breaks of the back and front walls, as shown in the section.



Both the pipes are fed from the cistern, and return below into the boiler; and the cistern being above the level of circulation, accelerates the motion of the heated fluid. The water in the trough, through which the pipes in both plans are laid, is sufficiently heated to be constantly evolving steam, which, penetrating through the stage and body of earth, excites the plants into vigorous and healthy growth, and with far greater certainty and regularity than can, without much care and labour, be obtained from dung or any other fermenting material.

The plan of working hotbeds by hot water has been yet but partially adopted; the scheme may be said to be yet in its infancy; but from the favourable results already reported of its efficiency, no doubt but improvements will be made in the heating apparatus, by increasing the capacity and powers of the boiler to answer many purposes at the same time.

We shall recur to this subject on some future opportunity, or as soon as we have matured some ideas which are now floating loosely in our mind.

FURTHER REMARKS ON THE POTATO.

BY GEO. T. DALE, WICKSWORTH, DERRYSHIRE.

HAVING promised to say something more on the Potato, I now do so. It has been said by a celebrated individual in the horticultural world, that the early potato may be planted at almost any period of the year, and a crop ensured. The same person maintains, that if the top of the plant be cut off by frost, it is of little or no consequence, as there always remains sufficient productive power in the potato to produce others. This opinion I must beg leave to controvert. For everything there is a season; and even granting it matters little at what time potatoes are planted, yet it must follow, as a matter of course, that if the top of the plant is cut off, it must weaken the powers of the same in producing tubers, as an extra effort has to be made.

It is absolutely necessary, from the time the seed-potatoes come out of the ground, that they should be as much as possible at rest, to ensure what I should call a good crop. This is only to be done by being particular as to where and how your seed is laid by for the winter. So tenacious is the potato as to heat, that a very low degree will immediately set its powers at work.

Much has been said with respect to setting the potato whole or cut. I was well acquainted with a scientific horticulturist who for twenty years was trying experiments on the potato. After that period,—indeed long before the expiration of that term,—he had come to the conclusion that the best crop was obtained by setting whole. Indeed, strange as it may appear to some, I knew an individual who, by setting a *single potato whole*, produced, by great pains in cultivation, the extraordinary number of seventy pecks in one season. This is a fact that I am aware will be disputed by many; but all who do so, I refer to my friend, Mr. Stafford Wellesley, whose authority will, I imagine, be sufficient: indeed, I am convinced it is possible to produce more. So much for its productive powers, if properly managed. I should recommend early potatoes to be set about two inches deep, and only to be earthed up once slightly. With regard to the later crops, I should say, do very little more: allow all the sun that you can to get to the rootlets. I think, three times out of four, harm is done by injudicious earthing up. Most early potatoes produce their tubers as near as they can to the surface; indeed they often lie above the ground. Seeing this is the nature of the plant, why earth them up as most do, making either a trench for the wet to drain into and scab the potato, or exclude the sun from the tubers, in spite of all their efforts to get to it. The

winter potato I would plant a little deeper, and earth up alightly. I feel convinced much of it does no good. To cottagers, small gardeners, &c., I would recommend saving all the refuse of their gardens, such as leaves, cabbage-stalks, and everything of that sort, to lay up to rot through the winter: if they have moss near, get that also. This will answer every purpose of stable-manure, and will cost nothing but a little trouble.

May 2nd, 1836.

I was passing by a cottager's garden a few days since; he was busily employed setting his potatoes, many of which had shoots two or three inches long. I observed, as he planted them, most of them broke off. I asked him if he thought they were good seed? He said they were such as he had always planted; but he had often had poor crops. I explained to him how it was. The man seemed quite surprised, but much pleased, and determined in future to adopt a different plan.

LANDSCAPE GARDENING.

LETTER TWELVE.

DEAR SIR—I ended my last with a short description of the view of the abbey, as seen from the lower end of the front lawn. This is a truly picturesque scene. The irregular course of the river winding along its abrupt banks and natural channel—in one place rippling over a pebbly shallow—in another, arrested in a glassy pool—gives animation; while the stately and venerable trees which skirt the woods on each side, overtopped by the pines and firs which crown the heights, seclude, while they protect, the principal object in the picture. The site of this ancient establishment, like all others of the same character, commands all those circumstances which were, at the time of their foundation, considered indispensable—namely, shelter from the rigours of a northern climate; a command of water, by which, in those turbulent times, the buildings could be secured by an impassable moat, except by a drawbridge; and, at the same time, the moat served as a stew or nursery for fish, so necessary to a Catholic ecclesiastical community. The land in its immediate vicinity being, like the bottom of all valleys or sides of rivers, exceedingly rich, answered well for kitchen gardening and the culture of fruit-trees, so necessary also for such an establishment. Its situation in a valley gave, moreover, a better view

of the declivous surface on both sides, and of the hanging woods, or other objects thereon.

In modern times, when a country residence is intended to be built, the choice of a proper site requires a good deal of consideration. On a first survey, it often happens that the most beautiful part to look at from a distance, is recommended as the best station for a house. This, though a very natural, is a deceptive impression ; because the beautiful ground cannot be all seen from the windows of a house built upon it. If, indeed, a proprietor wishes to make his house an eye-trap, to arrest the attention or provoke the envy of the public, or to form a fine picture for himself to take a walk or ride to look at ; then he has only to place his house on some commanding brow overlooking the turnpike-road ; but he, it is likely, may have cause to repent placing his house on that beautiful brow, as soon as he looks from its windows.

It is very often remarked by those who have not studied the subject, when they see a house surrounded by beautiful hills, that it is misplaced, conceiving that, if it had been placed on the higher ground, it would have looked better. So, indeed, it might, if the house, as a piece of architecture, be only considered ; but, as much more beautiful scenery may be formed on an acclivous, than on a declivous, surface, no one would sacrifice pleasing views, as seen from the windows, upon an ascending surface, for any upon a descending slope, which the inmates must go abroad to see.

But, on the other hand, as the *love of prospect* is said to be an inherent principle of the human mind, a castellated mansion, on a commanding eminence, has certainly most attractive charms. Where the surface sinks away on all sides from the ramparts or windows, and commands a distant horizon circumbounding an extensive tract of country, stretched out like a map before the spectator, with all its interesting objects of towns, villages, public and private buildings—such a range for the eye is at all times most gratifying ; and though the lord of the castle, unlike the proprietor of a secluded house, may see but little he can call his own, he has the privilege of overlooking that of others.

Both situations have advantages peculiar to themselves, and these are differently regarded, according as the proprietor is an admirer of extensive prospect, or content to sojourn in

“ An unseen, unseeing dell,”

The abbey to which I have called your attention belongs to the latter description, and, considered as a quiet retreat, is most perfect of its kind. It is shut out from the garish eye of day—a sort of extra-mun-

dane abode, the history and character of which is ever exciting an association of ideas of events, and customs, and opinions of other days, particularly to the antiquary, or to the man of studious habits.

I returned to Fairfax Hall much gratified with my visit to this unique residence, and full of reflections on what the abbey once was, when governed by a lordly abbot, attended by a number of canons, monks, and other clerical orders, besides seculars and servants, all supported by princely revenues for the practice of devotion, for disseminating true religion, for relieving the poor, and sheltering the weary pilgrim—all long ago suppressed, and fallen into other hands.

Some of the most extensive estates, and many of the most splendid private mansions in this kingdom, are the remains of those ancient ecclesiastical establishments. Some are converted into noblemen's palaces, others are baronial halls, and very many are now only farm-houses; but wherever such *vestigia* are met with,—whether those of an abbey, monastery, or priory,—there we are sure to find three valuable concomitant circumstances—namely, a fine situation, rich land, and pure water.

I mention this as a striking proof of the extreme care which was bestowed in fixing on eligible sites for those establishments, and of the great cost, which was voluntarily subscribed, for completing their erection, and bestowed in their endowments. To found and endow a religious house was, in those days of bigotry, considered as the highest instance of Christian zeal, and the most excellent mark of Christian duty.

But these establishments introduced indirectly a few national improvements, of which the advantages are enjoyed at the present day. Ornamental gardening was introduced by the Italian monks, and many fine varieties of orchard and wall fruit, as well as methods of culture, were brought over by the natives of France and Germany. The Italian or Dutch style of landscape gardening was first executed in the gardens of colleges, and in those of ecclesiastical corporations. The avenue, the clipped evergreen hedge, the geometrical parterre, the terraced gardens, with flights of stairs in the open air, were all designed by foreigners, and from thence copied into the private residences of the nobility and gentry in different parts of the kingdom. The remains of some of these topiary gardens still exist; but not being approved by modern taste, are rapidly disappearing.

Several of the French pears and grape-vines introduced about that time—i. e. during the reigns of the Seventh and Eighth Henrys—are, in all probability, still in our collections, and certainly many of our culinary and medical plants.

On re-entering the park of Fairfax Hall, I noted the following memoranda:—The back entrance-gate is on a similar plan to that of the principal; but both it and the keeper's lodge adjoining, are in a somewhat less ornamented style. It is placed on a cross road leading from the town of ——— to the county town of ———, and as convenient for travelling to either of those places, as the main entrance is for proceeding to the former, or to the metropolis.

The keeper's house is a roomy and comfortable dwelling—not a mere architectural *box*, like too many of those diminutive whims called porters' lodges. Attached to it there are various offices, as kennels for greyhounds, pointers, and spaniels, and a compact yard, and sheds for fattening a few deer.

We rode into the stable-yard of the mansion house, through the tunnel leading thereto; and at the inner end, and a little to the left, I noticed, for the first time, the paved platform and door of the ice-house, which I was told is an arched excavation under that part of the pleasure-ground, and consequently planted over with evergreen shrubs.

On dismounting, I expressed to my friend the great gratification I had had from our morning excursion; and he, with his usual kindness, promised me another treat of the same kind, to see a place belonging to a noble friend of his, of a very different character. After I have had this promised pleasure, I shall again trouble you with a few remarks. Meantime, believe me to be yours truly,

A. B.

ENTOMOLOGY.

NOTICES OF INSECTS DESTRUCTIVE IN GARDENS.

(Continued from page 143.)

THE *coccus*, or white-scale insect, often attacks the pine-apple plant, especially those in a stunted state of growth. Many different remedies have been recommended for their destruction, among which one of the most common is soot and sulphur finely ground together, and dusted over the plants immediately after being sponged with soft water, in which a little tobacco liquor has been infused. The powder should be allowed to fall into the axils of the leaves, and lay down upon the stem, where the insects often congregate. Some add a little stone vitriol and camphor, both pounded to the soot and sulphur, and throw it on the plants by means of a hair-dresser's puff. After thus dressing

the plants, it is advisable to keep them for a few days in a high moist temperature, which will either kill or banish every enemy of the plants.

The latter part of this prescription is, perhaps, the most effectual for driving the insects; and, indeed, it is now found, that, to recover sickly pine plants, and free them from insects, it is only necessary to put them upon a brisk stable-dung heat. The ammonious gas arising from the dung appears to be at once fatal to the insects, and nutritious to the plants. This circumstance has induced many pine-growers to raise, not only their successions, but also their fruiting plants, entirely on dung heat.

Many stove-plants are liable to be preyed on by the *coccidæ*; and if at any time they are not in free growth, or are particularly delicate in their shoots and foliage, they may be freed from the insects by being removed to a dung hotbed for a few days. The only thing to be guarded against in making such a trial is, not to expose delicate plants to the steamy heat of dung, which assuredly would be as fatal to the plants as to the insects. Orange-trees, myrtles, camellias, and all such firm leathery-leaved plants, may bear such a fumigation for a short time safely; but no herbaceous-leaved plant could sustain the effects of the effluvia but for a very short time.

When hothouse or greenhouse plants are seized by the scale, they are usually removed by a stick thinly pointed at one end, and a bit of sponge tied on at the other, with which the scales are loosened, and washed off with a weak solution of tobacco or quick lime in soft water. This, however, is a tedious process, and only effectual to stop the increase, rather than extirpate the insects. Frequent steaming, and sprinkling with water offensive to them, are the best preventives. Succulent plants, which cannot safely be drenched with water, should be fumigated by some noxious vapour, as sulphur, or the like, in a frame by themselves. A fumigating frame, of rather large dimensions, should be an appendage to every establishment where exotic plants, whether useful or ornamental, are kept; it would be found very useful for many purposes of the garden, for which neither a pit nor common frames without *risers* are adapted.

A species of *coccus* is sometimes met with on peach, nectarine, and grape vines under glass. The females become very large in the spring; the hinder part of the scale is raised up to allow a white cotton-like bag of their young to grow, and afterwards escape. At this time they are easily removed by the back of a knife, or by a hard brush.

The *coccidæ* which infest forest-trees, — as the poles of ash and the red or broad-leaved willow, — are of two kinds: the scales of the one

are elongated ovals; the other has crescent-shaped scales; and these two are often seen on the same tree. Sometimes one or both are met with on the smooth bark of pear-trees in gardens. To get rid of them in gardens, it has been advised to wash the whole tree with urine or salt and water late in the day, when a sharp night-frost is expected. The water freezing over and among the scales, raises them from the bark, and they are discharged entirely by the first thaw.

The *Allica nemorum*, a coleopterous insect, is what is commonly called the turnip-fly, so destructive to the field crops of that invaluable agricultural plant. The economy of this national scourge is as yet but imperfectly known, and therefore no effectual means have been yet discovered to prevent their depredations. They appear in gardens on radish, turnip, cauliflower, and other cruciferous plants, but are never very injurious here, because such small seed-beds being frequently visited, and easily dusted with a little slaked lime or dry ashes, the flies are by these means kept off. The turnip-fly, or beetle, is most destructive in its perfect state; but the larvæ of some other coleopterous insects are, in some instances, very annoying in gardens and nurseries. Those of the May-bug, or tree-beetle (*Melolontha*) are, in some parts of France, so numerous, that they destroy whole quarters of rose-trees in the public nurseries. They always choose light puffy soil to lay their eggs in; and, as their grubs remain three or four years in the ground before they assume the winged state, they have time to do much damage to the roots of trees and other plants. The larvæ of the hoary beetle and rose-chaffer are also injurious to the roots of plants; but they are never in this country seen in very great numbers, they being kept under by rooks, jackdaws, and magpies, which seek for and eagerly devour the grubs as well as the perfect insects. It is a remarkable instinct which guides these, as well as many other insects, to fly chiefly in the evening, to avoid their natural enemies.

The *wire-worms*, so injurious to the bulbs of the florist, are said to be larvæ of the *Staphylinæ* and *Elatridæ*, and are captured by burying raw potatoes, turnips, or apples in the ground infested by them: these they will prefer to the bulbs; and, if examined from time to time, the grubs may be caught and killed.

The *millepede* (*Armadillo vulgaris*) is a troublesome insect to gardeners, and particularly injurious to cucumber, melon, and other tender plants in hotbeds. The usual method of getting rid of them is by placing an old shoe stuffed with hay moistened with sugared water over-night in the frame, and shaking out the captured insects into a pot of water every morning; and this continued till all are caught. Relative to this insect, we are happy in the opportunity of presenting

a letter just received from our friend, Mr. H. Lake, of Uxbridge, reporting an easy means for destroying the *millepede*; it runs thus:—

“ Sir,—There has long been a great desire by all cultivators of the cucumber and melon, to exterminate the insect, *Armadillo vulgaris*, or *millepede*, from the frames.

“ I am happy, therefore, to be able to inform them, that, by the use of carbonic acid gas in the frames, not only will that formidable insect be extirpated, but the plants will also be greatly assisted in growth.

“ If you think it worth while to give the particulars an insertion in your periodical, I shall feel great pleasure in presenting them to you.

“ I am, Sir, yours truly,

“ H. LAKE.”

“ Uxbridge, April 20th, 1836.”

We shall feel much obliged to our friend Mr. Lake for his promised information, as the mode of applying the gas will be of great service to many of our readers.—EDITOR.

(To be continued.)

BOTANY.

ON THE STUDY OF THE SCIENCE OF BOTANY.

BY F. F. ASHFORD.

(Continued from p. 261, Vol. iv.)

Classis XVI.—MONADELPHIA.

Monadelphia, derived from *monos*, one, *adelphos*, a brother, consisting of plants that bear



flowers which are bisexual, furnished with stamens connected into one body at their base, but dividing upwards. This class consists for the most part of *Malvaceæ* and *Geraniaceæ*. Of the former, the major part are of little moment, consisting, in a great measure, of weeds and worthless shrubs of various parts of the world; among them, however, are some plants both of interest and ornament, especially the beautiful *Astrapeæ*, and the various species of *Bombax* and *Hibiscus*. The *Gossypium*, so important as producing the material of cotton, and *Adansonia*, or *Baobab* tree of Africa, remarkable for its immense size

and use as an article of food, are found in this class. The *Geranium*, *Camellia*, and *Passiflora*, are also genera of much beauty, the latter yielding some delicious fruits. The characters of this are,

1. *Calyx*, a perianthium always present, persisting, and in some genera double.

2. *Corolla* pentapetalous, heart-shaped, the sides of which lap each one over the next, contrary to the motion of the sun.

3. *Stamina*, the filaments united below, but distinct upwards; the exterior ones shorter than the interior. The anthers incumbent.

4. *Pistillum*, the receptacle of the fructification, prominent in the centre of the flower; the germen erect, surrounding the top of the receptacle in a jointed ring; the styles are all united below in one substance with the receptacle, but divided above into as many threads as there are germins; the stigma spreading and thin.

5. *Pericarpium*, a capsule divided into as many loculaments as there are pistilla.

6. *Semina*, reniform, or kidney-shaped.

The orders of this class, which are seven in number, are derived from the number of stamens, the styles being now discarded from distinction. Orders seven, viz.:

Triandria; *Tigridia pavonia*.

Pentandria; *Hermannia flamea*.

Heptandria; *Pelargonium tricolor*.

Octandria; *Aitonia capensis*.

Decandria; *Geranium Wallachianum*.

Dodecandria; *Pentapetes ovata*.

Polyandria; *Camellia japonica*.

Classis XVII.—DIADELPHIA.

Diadelphia, taken from *dis*, two, *adelphos*, a brother, or brotherhood, meaning that this class is furnished with bisexual flowers, having their stamens

united into two bodies. With regard to the importance of diadelphous plants, as applicable to the purposes of mankind, they may be said to hold the very highest rank. All the numerous varieties of pulse, whether eaten by men or cattle, as peas, beans, haricots, caravances, lentils, and others, are all produced from plants of this class. The best of our artificial grasses, such as clover, lucerne, saintfoin, &c.,



belong to various diadelphous genera ; and also a large proportion of ornamental trees and useful herbs.

The characters of this class being different from any other, I have given them at length.

1. *Calyx*, a perianthium monophyllous, campanulate, and withering, the base gibbous, the lower part thereof fastened to the peduncle ; the upper part obtuse and melliferous ; the brim quinque-dentate, acute, erect, obtuse, unequal ; the lowest odd denticle longer than the rest ; the upper pair shorter and farther asunder ; the bottom of the cavity moist, with a mellious liquor, including the receptacle.

2. *Corolla*, termed papilionaceous, unequal ; the petals expressed by distinct names, viz. :

Vexillum, the standard, a petal covering the rest, incumbent, greater, plane horizontal, inserted by its claw in the upper margin of the receptacle, approaching to a circular figure when it leaves the calyx, and nearly entire along it, and especially towards its extremity, runs a line or ridge that rises up, as if the lower part of the petal had been compressed ; the part of the petal next to the base approaching to a semicylindric figure, embracing the parts that lie underneath it ; the disk of the petal is depressed on each side, but the sides of it nearest to the margin are reflexed upwards. Where the halved tube ends, and the halved limb begins to unfold itself, are two concave impressions, prominent underneath, and compressing the wings that lie under them.

Alæ, the wings, two equal petals, one at each side of the flower-place underneath the vexillum, incumbent with their margins, parallel, roundish, or oblong, broader upwards, the upper margin straight, the lower spreading into a roundness, the base of each wing bifid, the lower divisions stretching out into a claw inserted into the side of the receptacle, and about the length of the calyx, the upper shorter and reflexed.

Carina, the keel, the lowest petal, often bipartite, placed under the vexillum and between the wings, boat-shaped, concave, compressed on the sides, set like a vessel afloat, mutilate at the base, the lower part of which runs into a claw of the length of the calyx, and inserted into the receptacle ; but the upper and the side *lacinix* are interwoven with the part of the ala that is of the same shape ; the form of the sides of the carina is much like that of the ala, and so also is their situation, except that they are lower, and stand within them ; the line that forms the carina in this petal runs straight as far as the middle, and then rises gradually in the segment of a circle ; but the marginal line runs

straight to the extremity, where, meeting the carina, they terminate obtusely.

3. *Stamina*, the filaments, of two different forms—a lower one that involves the pistillum, and an upper one incumbent upon it; the former, from the middle downwards, is cylindraceous, membranaceous, and split lengthways on its upper side: but the upper half terminates in nine subulate parts, that are of the same length with and follow the flexure of the carina of the corolla, and of which the intermediate or lower radii are longer by alternate pairs; the upper filament is subulate-setose, covering the splitting of the cylindraceous filament incumbent upon it, answering to it in situation, simple, and gradually shorter; its base is detached from the rest, and prepares an outlet for the honey on each side. The anthera, reckoned altogether, are ten; one on the upper filament, and nine on the lower, each of the radii being furnished with a single one; they are small, all of one size, and terminate the radii.

4. *Pistillum*, single, growing out of the receptacle within the calyx; the germen oblong, roundish, lightly compressed, straight, of the length of the cylinder of the lower filament which involves it; the style subulate, filiform, ascending, having the same length and position as the radii of the filament, among which it is placed and withering; the stigma downy, of the length of the style from the part turned upwards, and placed immediately under the anthera.

5. *Pericarpium*, a legumen, oblong, compressed, obtuse, bivalved, with a longitudinal suture both above and below; each suture straight, though the upper one falls near the base, and the lower one rises near the top, and opens at the upper suture.

6. *Semina*, a few roundish, smooth, fleshy, pendulous, marked with an embiso that is a little prominent towards the points of insertion.

7. *Receptaculum*, the proper receptacle of the seeds, which are very small, very short, thinner towards the base, obtuse at the disk that fastens them, oblong, inserted longitudinally in the upper suture of the legumen only, but placed alternate, so that when the valves have been parted they adhere alternately to each valve. Orders four, viz.:

Pentandria; *Monnieria trifolia*.

Hexandria; *Corydalis solida*.

Octandria; *Polygala myrtifolia*.

Decandria; *Templetonia retusa*.

(To be continued.)

MISCELLANEOUS INTELLIGENCE.

REMINISCENCES OF A VOYAGE TO AND FROM CHINA (*continued from page 180*).—Among the many flowering plants which were new to us, we could not overlook the early-flowering and fragrant *La Moè*, called by us *Calycanthus* (*Chimonanthus fragrans*), one plant of which we procured. This shrub is much esteemed by the Chinese, not only for its fine scent, but for some medical quality it is said to possess, as an antidote against the virulence of the small-pox. We had no means of learning how, or from what part of the plant, the medical quality was extracted, or how administered; but only the simple fact, that it is held in repute for its remedial virtue, as allaying the danger of this loathsome and, among that *smooth-faced* people, dreaded disease. This circumstance may be worth the attention of some member of the Medico-Botanical Society, as the plant is now plentiful in this country. We did not learn that any other species or varieties of it were known at Canton.

Another favourite climbing shrub, and which would be an acquisition as a conservatory plant in this country, is one called *Engchow*. It is employed as a treillage or court-yard plant at Canton; has elliptical, entire, smooth, pale-green leaves, and numerous yellow polypetalous flowers, which are also sweet-scented. It is probably either a *Magnolia* or a *Michelia*. The plants we had of it perished on the voyage home. We think we have seen a small plant of the *Engchow* in the collection of Mr. Tate, of Sloane Street, which he told us he had lately received direct from China.

We bought another flowering shrub, called *Chee* by the Chinese nurserymen. This flowered on the voyage, and proved to be the *Spiræa crenata* of Besser.

The *Nelumbium speciosum* is a famous Chinese plant, and plentiful in the canals all over the country. We did not think it necessary to encumber the ship with living plants, but brought home plenty of the seeds, which we previously knew would readily vegetate in any stove. We believe this fine aquatic was first flowered in England by Mr. Rangescroft, at the late Duke of Portland's, at Bulstrode, in the year 1790, which plant we saw before our departure for India. Some of the finest specimens we saw in China were in pots, and placed as thanksgiving offerings on the altars of the places of worship, for "mercies vouchsafed." We understood that these offerings were presented by women after their "confinement."

We got several plants of the *Tou-Cow*—a half-aquatic, very common in the gardens at Canton. This plant was in Mr. Slater's collection for several years before our visit to China, and was then, from the appearance of its foliage, considered to be an *Amomum*; but it was at last flowered by Mr. Wykes, at Messrs. Grimwold's, Kensington; after which it got into every collection under the names of *Globba*, *Renealmia*; but at last was settled by Roscoe as the *Alpinia nutans*.

The *Bombax ceiba*, already alluded to as a highly ornamental tree, being in British collections long before our voyage to India, we took only one plant on board, which, however, was lost on the passage home. As this tree grows freely, and is easily propagated by cuttings, it deserves some other and better treatment than it has hitherto had in our collections. Being deciduous, and presenting in winter a hardy-looking aspect in the neighbourhood of Canton, we had great hopes that it might be brought to a flowering state in Europe, by being planted on a warm border, or against a south wall. This we have never had an opportunity to try; nor do we know whether it has been tried by any one else, who has had our advice on the subject; but surely the tree deserves a place in a warm conservatory or palm-house, where, if planted in a large pot or box, in good loamy compost, it may, perhaps, be nursed up to a flowering bulk, and show its splendid blossoms. We know not whether the plant be susceptible of being *worked* in any way; that is, whether it could be budded or grafted on itself or other congenerous stock; if it could, the operation would expedite the period of flowering. But should such means fail, other expedients, to induce a dwarfish habit, might be tried, as keeping it long in the same pot, allowing it but little water, investing the stem with a tight bandage, or any other repressive means which would not quite kill the tree.

Many cultivators possess the means of making such experiments, and these may avail themselves of the hint. If a nurseryman, having a good stock of young plants, could flower an old one, his young stock would quickly disappear. The same means may be practised with many other tropical trees which have not yet flowered in our collections.

Another very beautiful tree attracted our attention, of which we purchased a drawing, and saw many beau-pots of the flowers in almost every private house and church we entered during a festival which, if we remember rightly, was called the "*Feast of Lanthorns*," happening about the end of February. This, in the language of the country, is called *Tauchong*, but of which not a single portable plant could be had for either love or money. Our slight stock of botanical knowledge only enabled us to mark it in our list as *Andromeda arborea*, as we were

not then acquainted with Loureiro's writings, nor that that missionary had already named it *Enkianthus quinqueflora*.

We were told that many large trees of it grew at some distance from the city, whence the country people brought bundles of the flowering spray, to sell in the streets to every one who was devout enough to be at the expense to decorate the domestic image of his deity, Joss, at that festival.

The fine-flowering plant called *Hong-gua* is very common in the gardens. This is the *Volkameria Indica*, introduced and first flowered by Mr. Slater, in 1791.

The *Yong-too* is a useful culinary fruit in China, which we found at almost every place we touched at in India, and already mentioned as the *Averrhoa Carambola*. This plant was introduced by Mr. Slater, in 1792, and soon afterwards by the late Duke of Portland.

We made all possible inquiry concerning the great staple commodity of Chinese commerce, the celebrated tea-plant. Nothing satisfactory could be learned from the Chinese nurserymen; but Messrs. Duncan and Arthur told us that neither of the sorts called Green and Bohea are the kinds cultivated in the tea-country. We saw two boxes of living plants consigned to Calcutta, at the instance of the East India Company, which were brought direct by Sir George Staunton from the tea-country, and said to be the true cultivated sort. We could see nothing in which they differed from the common variety called Bohea, except that the leaves were smaller and rounder, which we attributed to their recent removal. Much difference of opinion exists among travellers who have visited China, as to whether or not the various descriptions of marketable tea be gathered from the same variety or not. We were told that all the different kinds and qualities in the shops may be manufactured from the same bush—the different times of gathering and different processes of curing making the difference in quality, colour, &c. This we heard repeatedly asserted by intelligent Chinamen and others in the Honourable East India Company's service; but a most respectable writer in the Gardener's Magazine, and who had been in China himself, denies the possibility of green and black tea being produced by, or manufactured from, the same species. Unluckily for those who are desirous of ascertaining the fact, the writer alluded to has left the question where he found it, neither informing how the leaves of one sort become black in the process of firing, and those of another remain pale green.

It has often been proposed as a question, whether tea could be cultivated and manufactured in other countries as well as in China? There

is no doubt but that the plant will thrive equally well in soil of similar quality, and in the same latitude, either north or south of the tea-country in China; but whether it can be manufactured *equally cheap*, is the gravamen of the question. The southern slopes, or along the base of the Himalaya mountains, though too far from a shipping port perhaps, might be an eligible locality; but whether the population there are sufficiently numerous, and as industrious as the Chinese, is uncertain. But, no doubt, all this matter has already been canvassed by the Company.

That other leaves are mixed with the true tea, in some particular descriptions of it, is perfectly manifest. This is not done to increase the quantity, but to improve the scent; and for this purpose those of the *Olea fragrans*, a very common plant in China, is said to be employed. This ought to be a caution to informers against tea-dealers in this country.

The above-named plants formed the majority of the contents of the nine boxes packed at Cantou, and received on board the ship at the second bar, (a station in the river where all large vessels complete their cargoes,) about the first of March, 1794. The plants were then all looking prosperously, allowance being made for their recent shifting, from which some of them had not quite recovered.

Before leaving China, we may put down a few general observations relative to that interesting country, and which are more or less connected with the objects of our mission.

Concerning dietetic plants, the dead season at which we resided at Canton prevented us seeing all they cultivate; but, of roots, we saw a few small potatoes, convolvulus batatas, yams, beet, carrot, scallions, water-lily, one or two sorts of arum, a sort of turnip, ginger, turmeric, and the earth-nut, or water-chestnut (*Trapa bicornis*). Of leaves, we saw white beet, a sort of German greens, lettuce, endive, spinach, the sweet olive for seasoning; *Amarantus oleraceus*, two or three varieties; several sorts of sweet herbs, and tea, of course. Of legumes and grain, we only saw the seeds of the water-lily, dry peas, calavances, rice, and maize.

Of fruit they have a great variety. In no part of the world are oranges, and, indeed, all the citrus tribe, seen in greater perfection. A variety of orange, called, from its superiority, the "Mandarin," is very excellent: when perfectly ripe, the rind separates entirely from the pulp, the latter coming out whole when the former is cut. At the stalls in the streets, the sellers will allow a buyer to take as many as he pleases for a few *cash*, (a small copper coin,) provided the former are

allowed to retain the peels, which are carefully preserved for some purpose or other. There are several tropical fruits, as the *Musa paradisiaca*, pine-apples, quavas, dates, tamarinds, together with pomegranates, grapes, apricots, plums, peaches, including the little dwarf one (*P. nana*); pears from the northern provinces, but inferior; melons, cucumbers, and several sorts of gourds, chestnuts, olives, &c., besides a few which are peculiar to that empire, as the litchee and loungan (*Euphoria*), and loquat (*Eriobotrya*). They have also a fruit, resembling a plum, called *Kisumchu*, which is probably an *Anona*; another called *Pack-lam*, a beautiful tree, having fine large pinnated leaves, and bearing drupaceous fruit about the size of a damson-plum. The *Gaura trichoides* is also ranked among their fruit-trees.

Of their dwarfed trees.—We have already observed that the Chinese are remarkable for their taste in wishing to have even the most stupendous objects in nature in miniature: mountains, rocks, lakes, rivers, aged trees, must all be represented and modelled upon a scale of a few inches. The former are formed of natural fragments curiously and fantastically cemented together, leaving water-tight hollows and little channels to represent lakes and rivers. The dwarfed trees are, however, very curiously trained, requiring considerable skill, and a considerable period of time, to get the trees into the desired form.

The trees which they commonly choose to train as dwarfs are, their native juniper (*J. Chinensis*), the dwarf elm (*Ulmus pumila*), and the Indian fig (*F. Indica*). The means employed in dwarfing these plants are,—keeping them always in the same pot—allowing but little earth for them to grow in, the pot being half filled with rugged stones, which jut out of the surface;—among these some of the roots are brought out, twisted together, and the points again buried in the soil: no more water is given than but barely keeps the plants alive. The bark of the stem and branches is torn and mangled in all manner of ways; sometimes a branch is slipped from the stem, but not entirely off, so as to hang downward, and kept in that position by wire. By wires, also, the tortuous direction of the shoots are given; and being repeatedly stopped, and the half of every leaf cut off, tends materially to check all vegetative inherent vigour, and in time produces a *vegetable cripple*. When the native vigour is thus subdued, the plant becomes subject to moss, lichens, and every weather-stain so desirable on such an object, to give the idea of hoar antiquity to a plant only of ten or a dozen years' growth. Such dwarfed trees are considered valuable;

and some of the merchants imagine that they cannot make a more acceptable present to a European friend, than one of those dwarfed trees!

Orange, shaddock, and some other fruit-trees are kept in pots for ornamenting their shops or parlours; and if they happen to be destitute of fruit, others are fixed to the branches, to deceive the spectator. Many flowering-plants are treated in this way, as has already been mentioned; it is a species of self-deception which appears delightful to the minds of a nation of men who are by no means wanting in either natural acuteness or sagacity.

Our social intercourse at Canton was far from being disagreeable. The presence of the British embassy, together with the officers and parts of the crews of nearly three-score Indiamen, of different nations, made the streets of Canton an amusing and busy scene. We met several old schoolfellows, and several officers of the embassy we had known in England, particularly the two botanists belonging to the embassy, Messrs. Haxton and Stronach, the former of whom, we believe, is still a member of the Linnæan Society of London, though retired from professional business.

(To be continued.)

SIR,—I have sent you an account of an accident which has occurred to me; and if you think it worth a place in your Register, I shall be glad to see it, because I do not think it is generally known.

In May last I planted out some Vegetable Marrow and Pampions against a piece of wall, merely to hide it, not being able to get dung to the place without disturbing other things. I scarcely expected them to grow. A piece of common soda that I had in my pocket fell into the watering-pot; being called away, I forgot to empty the water, making sure that the alkali of the soda would be too strong. In about a week they shot out. I assure you the fruit were larger than those from the same seed I left on the bed of dung.

S. R., a Subscriber.

P. S. I mean to try the effect of soda on natural Cucumbers this year.

[We have long entertained an idea that soda, or pearl-ash, diluted in water, might be serviceable to vegetation, and particularly in preventing or curing the attack of mildew. We would caution our correspondent against making the solution too strong, which would certainly be fatal.—ED.]

ON THE MEANING OF THE TERMS ENDOGENOUS AND EXOGENOUS, AS USED BY BOTANICAL WRITERS.—IN the language of botany, and especially by those writers who treat of the natural system, the above terms are in frequent use, as designating the different manner of growth exhibited in the two grand classes, *Monocotyledoneæ* and *Dicotyledoneæ*—that is, plants which rise with one or two seedleaves, or cotyledons. To beginners in the study of the science, or even to those who are readers only, every term should be explained; and, therefore, it is only necessary to observe that the terms are compounds of two Greek words, viz. *Endogeneæ*, from *endon*, inside, and *geinomai*, to grow—that is, growth proceeding from within; and *Exogeneæ*, from *exo*, outside, and *geinomai*, to grow—that is, growth upon the exterior: consequently all plants which are increased by the addition of new members *from within*, are called Endogenous; and those which are enlarged by additions *on the outside*, are designated Exogenous. Modifications of the same terms have been used by some vegetable physiologists, to express the passage of fluids through the membranous partitions of plants. If a fluid issue from within, it is said to be *exosmose*; but if inducted, it is called *endosmose*.

Familiar examples of each character will be the best way of explaining them; and, therefore, it is only necessary to select two well-known plants belonging to each—say, for instance, the common oak, and the equally well-known tulip.

That the diametric bulk of the stem or trunk of an oak-tree is annually enlarged by new layers of bark and wood on the outside is perfectly evident. The heart or centre of the axis of wood is first formed, and the layers of the circumference last; the term exogenous is, therefore, properly applied in speaking of the manner of accretion of that tree.

All other trees and shrubs which rise from their seed, and are enlarged like the oak, belong to *Exogeneæ*. This manner of growth is necessary to the well-being of the plants themselves; because, if an exogenous plant receive any external injury, the wound is soon closed again by the new growths of bark and wood. The same constitutional property of the vitality being seated on the exterior, is of the greatest importance to the cultivator, because it is this circumstance which renders all our operations of budding, grafting, layering, and raising young plants from cuttings practicable, which could not be accomplished were the vitality seated in the interior of the system. The living membranes of the graft and stock being placed in contact with each other, form the desired union; and in the processes of layering,

or striking plants from cuttings, it is by exposing a part of this membrane to the soil which induces the protrusion of new active fibres therein.

The expansion of an exogenous plant is, therefore, a uniform swelling, as it were, of its exterior, from the time it rises from the seed, till it has acquired its utmost stature; the first-formed parts—that is, the centre of the trunk, and the exterior surface of the bark—falling to decay, while the latest formations are extending gradually outwards.

Now let us turn to a type of those plants which are denominated endogenous—the tulip, for example. Of this plant, we see it dormant in one season, and growing in another. Its vital, or rather its accrescent membrane is not seated on the exterior of the bulb, but within and at the bottom of it. At the commencement of the growth, we see the outside of the bulb composed of certain parts which have only a temporary existence for the protection of the fructification within. Instead of these external parts becoming enlarged during the spring growth, they are destined to decay, and almost wholly disappear at the end of the growing season. Watching the progressive development, we see the leaves and the stem bearing the flower all rise from the interior of the bulbous stem, all of which die and fall off at the end of the season, leaving a successor, not upon the exterior of the plant, as takes place in the oak, but in the very centre of the system, to come forth in the next year. All other plants, having bulbous stems and fibrous roots, are constituted and developed in a similar manner.

Asparagus is an endogenous plant, with what is called a bundled root. The incipient stems first appear as conical buds on the crown of the roots, and their development appears as nothing else than a simple elongation of the parts originally depressed in the bud, and differing in no respect from the development of a shoot of an oak or any other tree. It may be urged that the whole of the stem of asparagus is produced from the interior of the crown, and so far may be called endogenous; but this process is not different from that of a shoot of a dicotyledonous tree, which may also be said to proceed from the interior of the branch. Asparagus, however, is associated in the natural order *Asphodelææ*, where many of its congeners are truly endogenous; and, moreover, all being monocotyledonous, justifies the connexion.

But there are many other plants which exhibit the endogenous structure and development much more conspicuously than asparagus, as the *Musacææ*, *Pandaneææ*, and *Palmaææ*. In the plants of these orders all the growth, from the evolution of the first leaf or frond to its utmost

limit, proceeds from the centre—from the very heart of the stem. The latter appears to be formed by the united bases or footstalks of the fronds, and is as large in diameter when only one foot high, as, in the case of some of the Palms, when they are sixty or seventy feet in height. There is no lateral expansion of the stem in the successive years of the growth, like that of exogenous stems; so that the boles are perfectly cylindrical, and remarkably tough, as the whole appears to be a connected mass of strong ligneous fibres, extended perhaps the whole length of the stem. Nor are there any internal marks in the grain of the wood, to indicate either horizontal or vertical intermissions of the growth, as is so visible in the stems of *Exogenæ*.

These are the distinctions to which the terms endogenous and exogenous refer, and are particularly useful in descriptive botany, by superceding a multiplicity of words, which, without such terms, would be necessary.

REPLY TO CERTAIN STRICTURES ON VEGETABLE ORGANOGRAPHY AND PHYSIOLOGY, by MR. R. FISH.—Sir,—It is always a flattering circumstance to an author to find that his book has been read with attention by one who, from his intimate acquaintance with vegetable phenomena, must be considered a competent judge of whatever is said or written on the subject. For the attention bestowed on the perusal of the book, and for the free and sincerely candid remarks you have been pleased to make on some of the statements therein contained, accept our best thanks; and, pray, rest assured that no animadversions you have made, or hereafter may make, on anything advanced in that work *, will ever give its author the least uneasiness; on the contrary, he courts investigation, being in good hopes that the more the subject is studied and examined, the less he has to fear the results of experimental and practical inquiry.

Your manner of treating the subject is equally creditable to yourself as it is gratifying to us. You do not, like some individuals deservedly high on the scale of botanical science, and whom you have so pointedly alluded to, throw down the book with contempt, and only mutter a few words of pity for the visionary writer; on the contrary, you state your objections clearly and fairly, agreeing where you can, and civilly marking what you deem inexplicable. This is legitimate criticism, and what no author, however high he may stand in his *own* good opinion, can be offended with. We, therefore, thankfully offer a few words in

* “ Illustrations of Vegetable Physiology.”

reply, in the hope of showing that you have argued from assumed, rather than from incontrovertible, premises; and that, if you will quit those uncertain positions, and take purely neutral ground, a re-investigation will bring you much nearer to the goal of nature and true philosophy.

Had we leisure just now to turn over the book, we could from thence muster sufficient answers to everything you have boggled at; but besides the want of time, we feel it unnecessary to reply to every particular (involving too much egotism) which seems to thwart your *previously settled* opinions concerning the nature, motion, and powers of the sap; for, so long as you believe that the sap is elaborated *in*, instead of *by*, the leaves, and attribute all accretion to its organisable properties, so long must your mind be "steeled proof" against the reception of a contrary doctrine. And what proof, pray, has yet been had that the sap regularly descends, or that it is organisable? Can you or any one else bring forward a single indubitable proof of such a fact? You may think it "more philosophical, and more in consonance with the phenomena of organised existence, to admit at once a principle of regularity of movement, than to consider that those wonderful developments are effected by any process bordering upon being fortuitous;" but true philosophy attends only to facts, and can admit no principle of imaginary movement, how plausibly regular soever it may seem to be.

You refer us to the swelling of a stem above a wound or ligature, as a proof of the descent of the sap: as well may you assert that the descent of the roots into the ground is a proof of its subsidence, for they are exactly similar movements. But we have, as you know, advanced so much already on this circumstance in our book and elsewhere, to show that it is not owing to any constant or periodical descent of the *sap alone*, that any further disquisition would be nauseating, as well as fruitless, if what has been already said fails to convince.

Although you find no difficulty in accounting for the extension of new wood and bark from the upper side of a wound on the stem of a tree, you seem to be puzzled to find a good reason for its increasing from below. You believe that the increase above is caused by an accumulation of the descending elaborated sap, while you do not seem to consider that the ascending current has any such expanding power, attributing the increase there to some accommodating agency of the vitality of the system. This we cannot gainsay, because we know of no accommodating power, save the expansion of the vital membrane, which is always ready to repair a fracture in any part, or in any direc-

tion, whether upward, downward, or laterally. That "the bark possesses in itself an appropriating elaborating principle," is wholly unknown to us; and the proof adduced in support of the allegation is not at all conclusive, because the union of the transferred piece with that to which it is removed, depends entirely on the manner in which it is raised from the parent stem. If all the layers of bark, with the vital membrane or indusium attached, be removed to a cavity made in another tree to receive it, a union will take place, and the subsequent effects will be as you have stated; but if the living membrane be not removed with the first, nor cut into in forming the new place, no union can possibly take place; because every layer of bark, from the moment it is perfectly formed, and takes the name of liber, ceases to be imbued with life; and though it, for a year or two, be employed in the conduction of the fluids, it retains no vital energy to unite with any other body. Neither the last-formed layer of inner bark, nor the last-formed layer of wood, retain a particle of vitality after they are once formed.

You ask—"Do you not consider the sap necessary to the vigorous development of your indusium?" Most assuredly we do; but we are equally sure they are not identical, although, in the absence of either the one or the other, no increase or expansion can take place. The first may be called the *soul*, and the other the growing part of the *body* of the plant. You seem to conclude, that if a man knows how to graft, or bud, or propagate plants by the usual means, it signifies nothing to him to know which member of the plant it is that forms the union, or ejects the new roots. We admit that a man may be an excellent gardener without knowing a tittle of vegetable physiology; but how would he be laughed at if he were heard to declare that the union of the graft and stock takes place by the inosculation or adhesion of the two liber s or the two alburnums; or that all new roots were produced by or from those members! You say you have doubts of the existence of the indusium, because you have never seen it. What! never seen the *cambium* of those writers whence you have apparently borrowed the tenets of your physiological creed? Why, it is as visible all the summer as is any other member of the stem; and, *during that season*, you may identify it with the liber *then forming*, if you please, but not with that of the former year.

You appear to have no doubt but that a purely homogeneous and elaborated sap may be changed into wood and bark, though you cannot admit that an already organised member, scarcely visible in the winter, can be expanded into perfect form and consistence before the following

autumn. Surely you have forgotten that every animal and vegetable, nay, every different part composing these organised bodies, have existence long before they are visible to the naked eye, or even to the best microscopes. You lay great stress on the agency of the *principles of life* in vegetables, and speak of it as if it were a *thing* or *member* of the plant, endowing it with physical power, so that it can "make annual additions to the size of a ligneous plant." But this, you must be aware, is impossible. We know nothing of life but as an effect, or motion; and motion is not a thing which can either add to or abstract from the body or frame which it expands and vivifies. Remember, amplification is not creation.

You have, we beg leave to add, puzzled yourself unnecessarily with the comparison between the sap of plants and the blood of animals, admitting the difficulty of accounting for the change of the former into alburnum, on chemical principles, and adding that it is exactly like "the mutation of blood" into the bones of animals. But here you are in the clouds! for who has ever proved that bones are formed of blood, or that wood is formed of sap? Depend upon it, they are both mere assumptions: and, because blood and sap are the nourishing fluids of both the animal and vegetable systems, the actual formation of the solids have been attributed to be only mutations of the fluids, while it is well known that both are formed simultaneously.

You desire to know whether by the analysis of the *indusium*, we have discovered the constituent parts of liber and alburnum? We answer that, in the earlier stages of its growth, these parts are too minute and colourless to be seen distinctly; but, towards the end of August, they begin to be visible, and shortly afterwards complete. So, if in the beginning of this month you had dissected the embryo-fruit in a *peach-flower*, although you might detect the faint form of the stone and kernel, it is not likely that you could distinguish the thin film which envelopes the latter; but who would, therefore, deny its existence? Another question of similar import is added, viz. whether, "in the farinaceous substance of a seed, we have ever detected the ligneous consistence of a tree?" It would be very wonderful indeed if we did, because, as you must know, the ligneous membranes of the future plant do not lie among the farinaceous matter of the cotyledons, but on the point of the plumlet and little radicle situated between. Your last challenge, about whether we could, by any chemical process, bring a dead seed to life again? must go unanswered; for, though we might try our hand on a seed or a plant which had been *asleep* for a hundred years, we could not attempt the resuscitation of the *dead*.

Having gone over the contents of your very *searching* letter, we have to thank you for some very civil things you have stated in it, and to advise, if you ever again turn your mind to the subject, to surrender, if possible, those prepossessions which, from the tenor of your letter, appear to obstruct the entrance of whatever does not entirely accord with your first impressions, which, as the "*wise ones*" say, are ever the strongest.

One thing we have overlooked, and that is, concerning what you say of the effects of mutilation. The first example is that of a space of the bark, without a twig or bud, insulated by having annular rings cut out above and below, remaining almost stationary, while the stem above and below the incisions is increased as usual. Secondly, that trees bleed freest in spring and autumn. Thirdly, that a shoot stripped of its leaves in the growing season, if it does not die, makes no addition to its substance. Fourthly, that a leaf and lateral shoot together taken from a vine-branch, tend to render the buds in their axil abortive in a succeeding year; and, lastly, that if a rhubarb plant be divested of too many of its leaves in this year, it will not develope so many in the next. Now it appears that these several well-known particulars are brought forward as proofs that all increase of the substance is from matter which descends, and prepared through the instrumentality of the leaves. Now we happen to believe just the contrary. We are compelled to believe, from the natural constitution of a plant, that it is destined to draw its nourishment chiefly from the ground, through the agency of the roots. This nourishment is naturally *invited up* by the *transpiring* action of the leaves, and the vacuums produced by swelling buds, lengthening shoots, and craving fruit. The sap is, moreover, elaborated in the various organs, and assimilated to the essential qualities by the action and influences of the atmosphere, and the current or currents of it are accelerated or retarded according as there are vents for its reception. If the outlets, therefore, be dammed up by constriction, or stopped or reduced by mutilation, either stagnation or diversion into other collateral channels, as happens to a shredded vine, must be the natural consequence. The providing and expending organs are naturally inclined to balance each other; and when such an equilibrium exists, healthy and regular development takes place in all plants in a natural state. But if art interferes to maim the bark, reduce the size or number of healthy leaves or shoots, or abridge the number or length of the roots, derangement follows, to a greater or less degree, according as the violence or mutilation is more or less extensive.

This is the general law of vegetable development; and on an intimate

knowledge of its various processes, and how far these may be assisted, moderated, or checked constitutes the whole art and mystery of gardening ; indeed, as every plant becomes a new being from the instant it is taken in charge of the cultivator, it behoves him not only to know how to encourage and engross his plants by adding rich nourishment to the roots, and allowing due degrees of air, light, and heat to the head ; but he must also know how to *counteract* the natural tendencies of his trees especially, so as to make them answer the purpose of their culture in the best manner, and in the shortest time. This knowledge may certainly be gained by experience, and by the advice of a practical master ; but the tyro will do well to add to this the study of vegetable physiology, by direct observation and experiment, taking nothing for granted, but what will admit of practical proof (or as near an approach to it as can possibly be had) : this will shield him from all fanciful dictation, or imaginary notions on the subject.—ED.

NOTICES OF CERTAIN TERMS USED IN DESCRIPTIVE BOTANY. By A. W.—In every department of human knowledge there are certain conventional terms which are used by scientific writers which are not always, or readily, understood by many readers into whose hands the Horticultural Register may fall. For the sake of such readers, I have proposed to myself to give a short list of the scientific terms applied to the principal members of a plant, and which are in most frequent use, hoping they may be of some service to your younger readers. In following out this idea I shall commence with the

RADIX, the root, which is that part of the stem or axis of the plant which descends into the ground, or into any other substance or body on which the plant may grow. In some cases roots are exerted into moist air, whence they absorb the requisite nourishment. The divisions of the root are designated

RADICULÆ, and are those parts of the main root which proceed laterally from the principal. These are again subdivided into what are called

FIBRILLÆ, or fibres, which are the most attenuated and active parts of the root, their points being called *spongiolæ*.

If the part immediately beneath the surface is very much enlarged, or swollen, it is called

TUBER. These are various in shape, as the spindle-shaped, the spherical, the turbinated, &c.

Between the root and the stem there is a point which may be called the base of the stem, and consequently is the crown of the root. This, by some writers, is called

COLLUM, or the neck; others name it *rhizoma*, or root-stock; or *fundus planta*. English and German writers call it the life-knot, or *collet*. The stem above the collet is the

TRUNCUS—that part which elevates and bears the branches, *rami*, and the spray or twigs, called *ramuli*. When a stem is herbaceous, it is called *caulis*; hence stemmed plants are said to be *caulescent*: and if stems be wanting, they are called *acaulis*. Woody stems are named

TRUNCI ARBORI, and consist of several distinct concentric parts, all of which have proper names. The outer one of these is called *cortex*, or bark; the exterior of which is named *epidermis*; and the inner surface is known by the name of *liber*. Next, within the liber, is the last-formed layer of wood, which is called the *alburnum*, or white wood. This embraces all the internal layers of hard wood, *lignum*, formed in former years. These united form the *axis*, or woody trunk of the tree or shrub; and when cut across horizontally, rays, converging from the bark towards the centre, appear to unite the annual layers of wood, and are designated *radii corticales*.

In the centre of all is placed the *médulla*, or pith, composed of cellular matter, large, and occupying the greater part of the bulk of young shoots, but becoming less and less visible as the age of the tree increases.

Underground stems are called *sarmenta*, or runners, which at joints, *nodes*, put forth fibres, and send up shoots, *stolones*. *Susculi* are the stems or branches of mosses; and *turiones* are the shoots of the present year, not yet fully unfolded.

I shall trouble you with the explanation of a few more terms, the first leisure hour I have to spare,—being yours, &c., A. W.

FARTHER DETAILS RESPECTING THE DEATH OF MR. DOUGLAS, extracted from the *Gardeners' Magazine*.—"The following particulars of this most terrific occurrence are taken from the *Mirror*, for March 26, 1836. The editor acknowledges having copied it from *Ke Kumu Hawaii*, a mission newspaper, published at Honolulu, Oahu, which was lent him by a subscriber to the *Mirror*. This newspaper is printed at the mission press of Oahu, and in the native language of the Sandwich Islands, except the paper relating to Mr. Douglas, which is in English. It appears that the lamentable event occurred on July 12, 1834, six months sooner than was supposed to be the case.

"The document is dated Hilo, Hawaii, July 15, 1834, and is

addressed to Richard Charlton, Esq., his Britannic Majesty's Consul there. Intelligence of this distressing event reached Hilo on the morning of July 14, when a native came up, and, with an expression of countenance which indicated but too faithfully that he was the bearer of sad tidings, inquired for a Mr. Goodrich. On seeing him, he stated that the body of Mr. Douglas had been found on the mountains, in a pit excavated for the purpose of taking wild cattle, and that he was supposed to have been killed by the beast which was in the pit when Mr. D. fell in. Upon further inquiry, this person related in substance as follows:—'That on the evening, the 13th instant, the natives who brought the body down from the mountain, came to his house at Lanpahoioi, about twenty-five or thirty miles distant from Hilo, and employed him to bring it to this place in his canoe.' Mr. D., it seems, left Kohala Point during the previous week, in company with an Englishman as a guide, and proceeded to cross Monena Kea on the north side. On the 12th, Mr. D. dismissed his guide, who cautioned him on parting to be aware lest he should fall into some of the pits for taking wild cattle, describing them as being near the places to which the animals resorted to drink. Soon after Mr. D. had dismissed his guide, he went back a short distance to get a bundle which he had forgotten; and as he was retracing his steps, in some fatal moment he fell into a pit in which a bull had previously fallen. He was found dead in the pit by these same natives, who, ignorant at the time of his passing, were in pursuit of bullocks; and, on coming to the pit, found a small hole at one end of the covering of it. At first they conjectured that a calf had fallen in; but, on further examination, discovered traces of a man's steps, and soon after saw his feet in the pit, his body being covered with sand and rubbish. They went immediately in pursuit of the guide, who returned, shot the bullock, took out the body, and hired the natives, at the price of four bullocks, to convey the body to the sea-shore. He himself accompanied them, and engaged the natives to convey the body to Hilo, promising to follow immediately, and bring with him the compass, the watch, (which was somewhat broken, but still going,) some money found in Mr. D.'s pocket, and a little dog, a faithful companion of the departed traveller. On viewing the body, it was found covered with wounds; and as the accounts were not very clear, it was, therefore, thought due to the friends of Mr. D., and to the public, that an examination of the wounds should be made by medical men, and of all the circumstances of the case.

"As neither the guides nor any natives had arrived by the 16th, two foreigners were despatched to the place where the body was received

on the sea-shore, with directions to search out the natives who discovered the body, to go with them to the pit, and, after making as full inquiry as possible, to report to Hilo immediately. So far as could be ascertained, the guide was an Englishman, a convict from Botany Bay, who left a vessel at the Sandwich Islands some years previously: he had a wife and one child with him, to which circumstance was attributed his delay. In the meantime, it was feared that the body could not be carried to Honolulu. In the afternoon, however, Edward Gurney, the English guide, arrived. He stated, that on the 12th inst., about ten minutes before six in the morning, Mr. D. arrived at his house on the mountain, and wished him to point out the road to Hilo, and to accompany him a short distance. Mr. D. was then alone, but said his man had gone out the day before; referring probably to John, Mr. Diell's coloured man. Having breakfasted, Edward accompanied Mr. D. about three-quarters of a mile; and, after directing him in the path, and warning him of the traps, proceeded half a mile farther with him. Here they parted, thinking he could find the way himself, being anxious to reach Hilo before the evening.

"Edward returned home; but about eleven o'clock two natives came and told him that the European was dead, and that they had found him in a bullock-pit. They stated that as they were coming up to the pit, one of them observing some clothing on the side, exclaimed '*Lole!*' and in a moment afterward discovered Mr. D. within the pit, trampled under the feet of the bullock. Edward ran with a musket and charge, and on reaching the pit, saw Mr. D. lying on his right side, and the bullock standing upon the body. He shot the animal, descended into the pit, and with assistance got out the body of the poor traveller. His cane was with him, but the bundle and dog were missing. Edward knowing he had a bundle, asked for it. After a few minutes' search, a loud barking was heard at a short distance ahead, on the road leading to Hilo, and on reaching the spot the dog and bundle were found. On further examination, it appeared that Mr. D. had stopped to look into an empty pit, and also into that where the bullock was taken; that, after passing on up the hill some fifteen fathoms, he laid down his bundle, and returned to the fatal pit; and that while looking in, by making a mis-step, he fell into the power of the infuriated animal that gored and trampled him to death.

"The body was covered in part by stones, which circumstance is thought to have prevented it being entirely crushed. After removing it, Edward took charge of the dog and bundle, and of Mr. D.'s chronometer, compass, keys, and money found upon him; and, having hired

the natives to carry the body to the shore, (a distance of twenty-seven miles,) accompanied them, and came thence to Hilo. This narrative clears up many of the difficulties which rested upon the whole matter; and, perhaps, it will afford a pretty satisfactory account of the manner in which Mr. D. met his awful death." The black man mentioned in the letter probably lost his way, and perished in the mountain.

NOTICES OF BOTANICAL PUBLICATIONS.

EDWARDS'S BOTANICAL REGISTER, continued by Professor Lindley. The May number contains:—

1. *Oncidium altissimum*. Tallest *Oncidium*. A very beautiful orchideous plant, found growing on trees, formerly called *Epidendron altissimum* by Jaquin.

2. *Cratægus orientalis*. Oriental Hawthorn. A very handsome tree, with large snow-white fragrant vernal flowers, and rich purple autumnal leaves. The haws are large, five-cornered, and smooth. It is quite distinct from both *C. odoratissima* and *C. tanacetifolia*, and is the genuine Oriental *Mespilus* of Tournefort. It is a native of the Crimea and the parts bordering on the Black Sea.

3. *Ornithogalum chloroleucum*. Green-and-white *Ornithogalum*. A bulbous plant, found in the vicinity of Valparaiso, whence it has been brought by Messrs. Cummings, Bridges, and Mathews. It is a frame bulb, flowering in July. There is no previously described species that can be confounded with it; it is more curious than beautiful.

There is an interesting historical fact connected with the generic name of the genus, and which Dr. Lindley gives in a note. The name is compounded of two Greek words, signifying *a bird* and *milk*; so that it may be rendered birds' milk: but the corresponding name in Hebrew has been rendered "*doves' dung*" by our translators of the Bible, (see second Book of Kings, chap. vi., ver. 25,) an expression which has puzzled many a commentator. But the true explanation was given by Linnæus, in suggesting that the bulbs of *Ornithogalum umbellatum*, growing plentifully in Palestine, (hence called the "*Star of Bethlehem*" by English writers,) is eatable in that country even to the present day; and these were the bulbs that fetched so high a price during the siege of Samaria.

4. *Camellia Japonica Donckelaeri*. M. Donckelaer's Japan Camellia. A very remarkable-coloured garden variety, said to have been brought to Holland by Dr. Siebold. This was figured from a plant which flowered with Mr. Lowe, of Clapton; but, if we remember rightly, a plant was brought from Paris last year by Mr. Tate, of Chelsea, and was figured in some publication—we think, Paxton's Magazine of Botany. It is more curiously blotched than any other double-striped variety.

5. *Crataegus Moroccana*. Morocco Hawthorn. Said to be a native of Barbary, but certainly of Mount Sinai, in Palestine. It is in the garden of the Horticultural Society.

6. *Godetia rubicunda*. Ruddy Godetia. One of the most showy of the old genus *Oenothera*, lately separated therefrom and made a new genus by M. Spach. Dr. L. states, that, as a hardy plant, it contrasts well with the *G. Lindleyana*, (not *Oenothera Lindleyana*); thus adopting Spach's generic name for the Evening Primrose, formerly named specifically after himself. It is, indeed, a most desirable border plant.

6. *Zygopetalum cochleare*. Spoon-lipped Zygopetalum. The Zygopetalums are a curious, fragrant, and beautiful genus of the order *Orchideæ*. Among the species, this is one of the most attractive. The flowers are ample, much variegated in colour, and diffuse a scent equal to that given out by lilies of the valley. It is a native of Trinidad, is grown in earth, in a damp stove, and is successfully flowered in Mr. Knight's collection, whence the drawing was taken.

SWEET'S BRITISH FLOWER-GARDEN, continued by Professor Don. The number for May contains:—

1. *Lathyrus rotundifolius*; var. *ellipticus*. Round-leaved Everlasting Pea. A climbing perennial herb, extending to the height of three or four feet. It is uncertain of what country it is a native, unless it be that found in Georgia by Bieberstein. The plant from which the drawing was taken was communicated by Mr. Cameron, of the Birmingham Botanic Garden. The plant is altogether smaller than *L. latifolius*, and is, on this account, adapted to situations where that species, from its rampant habits, would be unsuitable.

2. *Eutoca Menziesii*. Mr. Menzies' Eutoca. A very beautiful hardy annual, belonging to the natural order *Hydrophyllææ*, introduced by the Horticultural Society in 1826, from seeds transmitted by the late Mr. Douglas. It ripens seeds, if grown in dry situations.

3. *Clematis calycina*. Minorca Virgin's Bower. An evergreen climbing shrub, producing an abundance of greenish yellow flowers, sprinkled over with minute purple spots. It is a late-flowering plant, and requires the support of a south wall. The specimen figured is from the collection of the Hon. William T. H. Fox Strangways, at Abbotsbury, Dorset.

4. *Orithyia uniflora*. Single-flowered Orithyia. A bulbous-stemmed plant, belonging to *Liliaceæ*. It has very much the habit of a tulip, and is only distinguished from that genus "by its distinct and elongated style." After its first discovery on the rocky banks of the Irtych, and other streams which descend from the Altai Mountains, by Laxman, it was considered to be an *Ornithogalum*; but since it has been received and flowered at the Botanic Garden, Chelsea, by Mr. Anderson, it has been dissociated by Professor Don, and named *Orithyia*, after the fabled wife of Boreas.

PAXTON'S MAGAZINE OF BOTANY. The number for May contains:—

1. *Nerium thyrsiflorum*. Dense-flowered Oleander. This, like all the genus, is a highly ornamental plant; but it is doubtful whether it be really a species, or a variety only. However this may be, it is well worthy a place in every collection, as its large thyrse of flowers renders it very conspicuous.

2. *Ixora grandiflora*. Great-flowered scarlet Ixora. Of this extensive and beautiful tribe of shrubs, this is said to bear the largest truss of flowers. This alone is a sufficient recommendation of the plant, and enough to make it desirable in every stove collection.

3. *Dendrobium moniliforme*. Bracelet-formed Dendrobium. A fine Chinese orchideous plant. Like others belonging to this highly-valued order, the flowers are remarkable both in shape and colour.

The above are the only plants figured; but this number contains a vast mass of practical information of the names and culture of plants; viz., a select list of stove exotics, with the culture and times of flowering of each; to which is added the culture of the genus *Edwardsia*. Also an account of all the new and rare plants lately figured and described in other works on Botany; together with the botanical operations for May—as shifting, propagating, &c.

SMITH'S FLORIST'S MAGAZINE.

The May number contains finely-executed figures of the *Marcellus Tulip*—a fine bizarre, at present in high repute. Under this is given

the best rules for the cultivation and management of tulips in general, with a figure of a convenient awning for a tulip-bed, and directions for its erection and use. There is also an excellent defence of the florists' *peculiar taste* in estimating the merits of flowers, showing that their taste respecting them is quite as rational as that of the *cognoscenti* respecting pictures.

The next figures are those of the *Madam Hardy* and *Village Maid* Roses, with full directions for their culture from the budding (which is illustrated by figures) to the perfect plant.

The next plate exhibits the *Emeline* and *Princess Frederica* Picotees, with their history, and the best method of propagation and culture.

The fourth plate presents us with the *Achilles Auricula*—a most beautiful florist's flower, accompanied with full directions for the culture of this much-admired tribe of plants.

NOTICES OF FLOWER-SHOWS, &c.

ON Saturday, the 14th, the HORTICULTURAL SOCIETY OF LONDON had its first exhibition of flowers and fruit for this year. The day was deliciously fine; and, although vegetation is somewhat backward, the gardens looked as fresh and gay as possible in their young verdure. The company was quite crowded, as might naturally be expected, by those wishing a little fresh air. There were three bands in attendance on this occasion. The display of flowers was one of the least attractive that we have seen here—a circumstance owing, no doubt, to the protracted severities of the season, which repressed vegetation in the open air, and in hot-houses compelled the use of higher artificial temperature than is congenial to vegetable life. The whole delicate class of *Cacti* and azaleas seemed particularly to have suffered from these unkindly influences; the *Pelargonium* tribe bore less appearance of unhealthiness; the fruits looked, comparatively, in better condition; the specimens of Hamburg grape were very luxuriant; some oranges were amongst the finest we have known of this country's growth; and the display of cucumbers was also good. While we have to remark that the flowers were less luxuriant in appearance, and more scanty in point of number, than we have before seen here; we need scarcely add, at the same time, that they formed a delightful exhibition. Amongst the visitors to the gardens we noticed the Ambassador from Oude, who

seemed much interested in a display of our northern rivalry with the brightest floral ornaments of his native land. The following is a list of prizes adjudged on the occasion:—

GOLD KNIGHTIAN MEDAL, to Messrs. Rollison, for the best stove *Orchideæ*; Mr. Green, gardener to Lady Antrobus, for stove or greenhouse plants, in collections of ten varieties.

LARGE SILVER MEDAL, to Mr. W. Smith, for greenhouse azaleas; Mr. Green, for *Cacti* in flower; R. Gibson, Esq., for melon *Cacti*; J. Allcard, Esq., for ferns; Mr. Davis, gardener to Lady Clarke, for grapes, Messrs. Luscombe and Pine, for heaths; Messrs. Rollison, for Asiatic *Orchideæ*; ditto, for American ditto; ditto, for a collection of stove and greenhouse plants; Mr. Lane, gardener to J. H. Palmer, Esq., for a collection of stove and greenhouse plants; Mr. J. Young, of Epsom, for a New Zealand plant; Mr. Green, for a Chinese plant.

SILVER KNIGHTIAN MEDAL, to Messrs. Wather, for hardy azaleas; Mr. W. Smith, for greenhouse azaleas; Mr. James Young, for ditto; Mr. Salter, for *Amaryllideæ*; Mr. Fuller, for ditto; Mr. Green, for calceolarias; Mr. Glenny, for ditto; Mr. J. Wilmot, for cucumbers; Mr. Lane, for ditto; Mr. Falconer, gardener to A. Palmer, Esq., for *Cacti* in flower; Mr. Rollison, for melon *Cacti*; Mr. Redding, gardener to Mrs. Marryatt, for ferns; Mr. Wilmott, of Isleworth, for grapes; Mr. Mountjoy, of Ealing, for heart's-ease; and Mr. Glenny, for ditto.

METROPOLITAN SOCIETY OF FLORISTS.—Fourth show, at Vauxhall, on June 16th, or 23rd. Fifth show, July 20th—Carnations and Picotees—at Vauxhall (members only). Sixth show, August 11th, at Vauxhall, in honour of the Queen's birth-day. Seventh show, September 8th, at Vauxhall. Eighth and last show, September 27th, at Salthill, near Windsor.

REVIEW OF MUDIE'S ASTRONOMY.

Astronomy for Schools, Families, and private Learners. By Robert Mudie, author of "*The Heavens*," "*The Earth*," &c. Orr and Smith, Paternoster Row.

This is another precious gem from the fertile pen of the talented author. The purpose and aim of this little volume is to smooth and render easy the approach to the temple of the skies.

Mr. M. had often noticed the difficulties which beset the tyro on the very threshold of the science. The young scholar has no compre-

hensive idea of either measurable or immeasurable space ; he is so bound down to his mother Earth, that he can neither divest himself of an impression of her fixedness, or that the apparent motion of the sun and other heavenly bodies is not real ; and far less could he have any clear ideas of the convolved and visibly contrary motions of the other planets.

Mr. M. has endeavoured, and we think successfully, to clear away those clouds which obscure the real positions and motions of the planetary worlds from the ken of a young pupil, by showing how to reconcile "the real motions with the apparent ones, which are, generally speaking, the very reverse of the real ones : and unless a beginner shall be shown clearly, at the commencement of this science, why he should *distrust his senses*, he feels some difficulty in getting rid of scepticism afterwards ; and although he may assent to the words of the true statement, he continues to have doubts concerning them." It is by detaching, as it were, the student from his terraqueous abode, and placing him high in the ethereal vault, even above the sun itself, that he may see all the revolving bodies of the solar system at a glance, which can alone enable him to comprehend the "mighty maze."

It is by this extra-mundane contemplation of the constitution of the heavens, that the author has infused into this little elementary work, and with the most perfect plainness, some of the most profound researches and discoveries of the science of astronomy ; on which account it deserves to be read and studied by every one wishing to acquire a competent knowledge of this interesting science.

CALENDARIAL MEMORANDA FOR JUNE.

WHEN an editor of a monthly periodical has once gone the circuit of the months with calendarial remarks, it is usual, and quite natural for him, when he arrives at the point where he began, to refer his readers to the corresponding period of the bygone year for seasonal memoranda. To a reader who keeps the numbers constantly at his elbow, this may be no great trouble ; but many would find the reference inconvenient. We shall, therefore, continue the memoranda, but in a somewhat condensed form, as we consider a naked hint is useful, and all that is wanted by a reader constantly engaged in the business.

Common Beans and Peas.—It is customary to put in the latest summer crops of these legumes in this month. Of the former, to small sowings of the *Magazan* are sufficient; the first early in the month; the last near the end. By placing on damp ground, or assisting the plants during August and September with water, if the season be dry, forwards them so as to yield their pods in October and November. Of peas, two or three sowings may be tried. Prussian Blue and the Pearl, both dwarf sorts, we always found most suitable for the last crops, and, coming in so late, say about the first of November, have been then considered a rarity. Knight's Marrow may also be *tried* in this month; but these, as well as all other sorts of peas, are particularly subject to mildew, when the autumn is dry and warm, and, unless they are copiously watered in September, seldom come to any good. The bearing and advancing crops of both these vegetables will now require the ordinary treatment of earthing up, sticking, &c.

Kidney Beans.—Succession crops of both dwarf and runner sorts should be put in; the first at least twice, and the second twice also, in order to ensure a constant and sufficient supply. Constant and clean gathering of the oldest pods is a certain means of prolonging the increase.

Cauliflowers are in perfection. Preserve the colour by shading with their leaves; prick out the seedlings intended for the Michaelmas crop, preparatory to their being planted out for good in July.

Brocoli.—As soon as convenient, all the different sorts of brocoli large enough for the purpose may be rowed out on rich deeply-dug ground. If the latest hardy sorts, as the Siberian, &c., be not already sown, the beginning of this month is not yet too late.

Cabbage.—Another piece may be now put out, and two more small beds sown, to raise plants for autumn cabbage or coleworts; also another piece of savoy, and all other sorts of winter greens. If leeks are not yet planted, this work should be done without delay.

Celery.—Continue to plant out celery in trenches from time to time, to keep up a regular supply. Continue also to prick out seedlings from the seed-beds, to forward them for going into trenches in August.

Turnips, Spinach, Lettuce, Endive, and salad plants may be sown twice or thrice in the month. *Love-Apples* may be put out against walls or pales. Ridged *Cucumbers* must be attended to, and treated with water, air, &c. *Carrots* and *Parsnips* should be thinned and kept free from weeds, as well as all other plants in drills or rows.

Cardoons may yet be sown. Cease cutting *Asparagus* after the middle of the month. Herbs may be propagated; and the general business includes destroying weeds, slugs, snails, and all hurtful insects.

FRUIT TREES.—These, whether on walls, espaliers, or otherwise, require at this season constant attention, not only for the purpose of displacing irregular growths, but for freeing the trees as much as possible from the myriads of insects with which they are this year infested, owing, no doubt, to the very dry summer of the last. Frequent washings with water or soap-suds, and hand-picking, are the only and most efficient means to disperse the insects, and in some measure to prevent the same annoyance in another year. Thinning fruit is a part of the labour of this month, and lucky are those who have this business to do. The gooseberry caterpillar appears to be plentiful, and, if not attended to, will injure both trees and fruit. Slugs and snails must be banished by drenchings of lime-water, or, where it can be applied, with hot powdered lime. Birds must be kept off the early strawberries and cherries; for, though small birds do much good in a garden, by destroying thousands of insects with which they feed their young, they reward themselves by taking a full tithe of the earliest fruit.

FLOWER GARDEN.—Dahlias must now, if not done already, be placed in their blooming stations. Stakes will be required for their stems; their situation should be sheltered rather than shady, and they should always have a fresh compost of rich loam and road-sand to grow in. Pot off seedlings, if not already done. *Auriculas* may now be shifted; and Tulip, Hyacinth, and Ranunculus beds may still require attention, to preserve the beauty of the late flowers, by shading or other care. Carnations require good nursing, to ensure vigorous growth and perfect bloom. Tender and half-hardy annuals may be placed in the open borders, as well as any greenhouse plants that may be spared for that purpose. Transplant annuals previously sown too thick. Sow biennials; and propagate, by cuttings, every plant of which a supply may be wanted.

Greenhouse plants, now in their summer station, will require water daily; and all necessary steps should be taken now, to ensure a full bloom of every sort of flowering plant, till the frost of winter sets in.

REMARKS ON THE WEATHER.

AFTER a very changeable and protracted winter, a sort of summer has set in upon us rather suddenly, and without any intermediate season which might be called spring. Of course vegetation was kept in check by the first, and too rapidly excited by the drier and warmer change. East and northerly winds have, however, prevailed, and the air on evenings has been chilly and ungenial. The flowers of plums, pears, and early cherries have suffered greatly in all exposed situations; and wall-fruit, from the night frosts, are in many places entirely cut off. Hardly any of the fruit-trees have blossomed strongly: the apple blossom particularly seems to have been hurt by the cold and wet, while yet in the bud; for, in looking at an orchard, we can only see a tree here and there covered with healthy bloom. A sprinkling of the fruit is fairly set; but there is no estimating, as yet, the probable amount of crop.

These casualties, affecting so much the cultivation of fruit, causing painful disappointment after much expense and care bestowed, and the strongest hopes excited, will more than ever impress the necessity of defending fruit-trees from the changes of weather during the time they are in flower. This is a resolution taken, perhaps, by every cultivator immediately after any serious loss of fruit; but, some how or other, that impression wears off; and when the time arrives at which such precaution should be taken, from some favouring aspect of the sky, or some delusive hope that the present will not be so severe as the former year, the intended measure is delayed till an unexpected frost reminds the superintendant of his remissness.

We have noticed this season what we have often had proofs of before, that the flower-buds of peach and nectarine trees are destructible by frost long before they open or are coloured, retaining, however, just as much vigour as will enable them to open weakly and drop off. Trees which we have attended to this spring have been regularly covered *every* night with Russia mats, since they first began to swell and show a little colour; but, notwithstanding, not a single fruit has set, though they were very likely trees to bear. This shows that the flowers were injured before the coverings were applied.

On the morning of the 14th inst. we had, about London, a heavy and delightful shower of warm rain, happening most opportunely for seedling crops and fruit-trees. It seems to have been but partial, and a dry south-easterly wind has again set in.

Lilacs and laburnums are now in full flower; but the mulberry-tree (the best index of the advance of the season) is just beginning to be *greenish*.

May 24th, 1836.

PAXTON'S HORTICULTURAL REGISTER,

JULY, 1836.

HORTICULTURE.

ON THE COILING SYSTEM OF VINES.

WE have long had an impartial eye upon the various articles and letters written *pro* and *con* respecting this system. There is much to be deprecated in the spirit which the arguers on both sides have assumed, for—as is but too common—a great degree of acrimony has been indulged in, which in no possible way can be productive of good.

We are quite confident that the originator of the coiling system—Mr. Mearns, gardener to his Grace the Duke of Portland, at Welbeck—conscientiously believed, that, in promulgating his own opinions, he should impart a knowledge of facts which could not fail to do essential service, and impart pleasure as well as knowledge, to every cultivator of the vine. But they who best know this worthy and greatly experienced gardener, are well aware that his enthusiasm is pre-eminent; what he does—what he espouses—he does and follows up “with all his might.” This highly-wrought spirit sustains a man while struggling in an ocean of difficulties, and frequently bears him up: he thus comes off victorious, and “more than conqueror;” but in some few instances it induces him to make a premature *exposé*—to wear his heart upon his sleeve, too much exposed to the eye of criticism.

We would fain lend the help of our feeble arm to support Mr. Mearns, for we *know* that grapes *may* be developed, grown, and completely matured, by a coiled shoot of a vine—a regular *bearing-shoot*—cut from a wall, destitute of roots, and passed round a No. 12 pot in

December, January, or February. We repeat it, that *we know*, from our own individual experience, that perfectly ripened fruit *may* be produced by such a branch within five or six months after it has been introduced into a stove, the pot being filled with light turfy loam, with or without stimulating manures, and plunged into a gentle leaf-bed. But while we thus uphold the possibility of effecting so extraordinary a process, we must candidly avow that we greatly fear nine out of every ten attempts will prove utterly abortive, and that for several reasons:—first and foremost, the *sap* or vital fluids retained in the system of the amputated branch, be *that* old or young, (and certainly one which includes two, three, or four feet of an old-spurred rod, with an annual short-jointed bearing shoot, with prominent eyes, two or three feet long, is to be preferred,) is not sufficient to bring to full development and maturity those processes which are indispensable to fertility, unless an extraordinary volume of rootlets be rapidly protruded; and this great desideratum cannot reasonably be anticipated under any modes of ordinary treatment;—a failure, therefore, must attend the experiments of most persons; and, as man is naturally impatient, much bitterness of feeling is but too apt to succeed to disappointed hopes.

Secondly, Mr. Mearns has made it an especial condition that all the eyes or buds of that part of the branch which is to be coiled under the soil, are to be blinded—that is, cut entirely away. In this he has lost sight of the efficiency of the buds, and has adopted the very method which, of all others, would tend to defeat the object that he has in view. *Buds* are the origin of roots; and it may be safely asserted, that, with very few exceptions, cuttings deprived of these systems of life must fail to establish themselves in the soil; in fact, there are abundance of facts which tend to prove that buds—those of the vine particularly so—do not only produce roots a little below their points of junction with the stem, but, if placed only a few inches below the surface of the soil, actually *become roots themselves*. It was feared that, were all the buds left on the coiled stem, a forest of young shoots would be thrown up, which could not fail to prove antagonists to the principle of growth in the eyes of the single *annual shoot* intended to develope leaves and fruit; but the idea was purely hypothetical, for, as has been already premised, the greater number of deeply-buried buds must and would assume the form and office of roots. A few, indeed—those which would be placed near the surface—might break as shoots, and rise into the light; but they would be productive of a corresponding system of fibrous radicles, and might be removed after they had grown three inches high. We removed several vines from

pots early in the last spring into an open border, placed the roots in a convenient situation, and laid the stem in a drill from six to three inches deep, permitting only a few of the upper buds to emerge from the ground. The plants pushed healthily, and being taken up in the autumn, masses of fibres were found at the point of every buried bud, tracing off to right and left, in very beautiful order. The old roots did not appear to have extended, and *not one shoot had pushed upward from the layered stem*. Mr. Mearns had not experimented for a sufficient time before he announced his discovery; he was in haste to reveal what he assuredly believed would prove a practice of eminent utility; and herein he erred, not however, to the effect of wilfully misleading his horticultural brethren and the practical amateur, but purely in as much as his enthusiastic zeal led him to anticipate too much. The world is ungrateful, and he has been subjected to much obloquy for merely a well-intended, premature solicitude to communicate knowledge. But *coiling*, though it may and will fail generally to produce good fruit during the first year, is an admirable process for effecting the propagation of strong-rooted plants for pot culture.

A vine of old or last year's wood, coiled from three to four feet in a sixteen or twelve pot, one eye only being permitted to *approach* to within half an inch of the surface,—the *whole*, however, being covered with light vegetable earth, made open by bruised bones, and being well drained at bottom,—will push vigorously, and may produce a shoot twelve feet long, and nearly half an inch in diameter, in one season. Such a shoot, well trained, will support from six to twenty clusters (according to its kind and the shortness of its joints) in the second year. Does not such an announcement merit praise in lieu of contumely? "*Palmarum qui meruit ferat*:"—we offer him our best thanks, while we unfeignedly regret the consequences of an over-hasty zeal.

Φιλόσοφος.

ON THE SHRIVELLING OF GRAPES.

BY MR. W. DENVER.

Battle Abbey, June 20, 1836.

DEAR SIR,—In my former paper on the shrivelling of grapes, I promised to say something more on that important subject; and as some of your readers seem to wish it, I feel in duty bound to do so. With this view, I solicit the assistance of all who have studied the nature of the grape vine, and have had opportunities of seeing this disease; for, let it be remembered, the subject is one that concerns both proprietors

and gardeners. The disappointment and loss are great indeed to those who have vineries, and have been expecting their tables to be supplied with good grapes at a certain period, to find, a little before that time arrives, that half, or more, of their grapes are destroyed by the disease of shanking. The gardener, too, feels quite as much disappointed when he finds, after all the attention he has paid them, and all the means he has adopted for their preservation, the greater part of the grapes under his care attacked with this disease.

It is the opinion of many persons that this disease proceeds from the want of air. This I believe not to be the principal cause of it, but am ready to admit that it often helps to promote it. We know that when the human frame is attacked with a disease, that its progress or retardation often very much depends on the skill of the medical attendant, and the attention of those that are about the afflicted. So it is with the disease in grapes. When there is the least appearance of shanking or shrivelling, great attention should be paid in giving a good and regular supply of air; for the closer a house is kept, the faster the disease will increase; and the higher the temperature, the quicker will be the motion of the sap, and the faster the sap will be required from the roots of the vine; and when their stock is exhausted, there is no hope for the grapes, for they are past recovery. But, on the other hand, if attention be paid in giving them a constant and sufficient supply of air, in a short time the disease will be very much checked, and ultimately subdued.

I see that your correspondent, Mr. Dale, is inclined to think, with some others, that shanking is brought on by damp and an over-heated atmosphere. Now I beg to ask those who are of that opinion, why the disease does not take place at an earlier stage of the growth of the grapes? because, whenever I have seen shanking in grapes, it has invariably been about the time they begin to change their colour, or a little later. It is very clear, then, that when grapes arrive at this stage of their growth, neither the wood nor the pedicles are as tender as they are at an earlier period, and are, therefore, I should think, less liable to suffer from external causes. Besides, by the time grapes begin to change colour, most good grape-growers have ceased syringing, steaming, &c. &c., when, of course, there cannot be half the damp that there is when those processes are in operation.

It is my opinion that the above are only secondary causes. When the vines are weak, every little unfavourable circumstance affects them; but when they are strong, and master of their work, (that is, able to bring to maturity the crop of grapes they bear,) neither damp nor a warm atmosphere will hurt them much. There is one great evil but

too prevalent amongst those who have vines under their care, and that is, they lay in an unnecessary quantity of wood in the summer. I have seen vineries where the wood has been laid in three times thicker than it ought to have been, which of course weakened the vine, and rendered it unfit to bear and mature good grapes. Besides, all superfluous wood is supplied from the roots, and must, therefore, necessarily tend materially to weaken the vines.

I am further of opinion that vines often suffer much from bad management in the summer. Some persons think this part of the business but of little consequence; but it should be remembered that the future crop of grapes very much depends on the present summer's management. A few weeks ago I heard a gardener say, that he did not pay much attention to the thinning-out of the shoots in the summer, for he thought it was not of much consequence. Whilst such an idea as this prevails, it is not to be wondered at that vines are found to be weak, their fruit inferior, and shanking making great ravages.

In conclusion, I beg to observe to those who are about to plant vines—be sure to lay your borders dry, (by draining, &c.,) and do not allow your vines to bear too soon. After they begin to bear, never leave more on them than they can bring well to maturity. Never lay in unnecessary wood. Paint the wood-work of the house every year, and whitewash the walls, putting a little sulphur in the wash. Dress the vines with a mixture of soft-soap and sulphur: this should be done after the winter pruning. Syringe the vines often, but not when they are in flower. After they have begun to change colour, never force them.

If the above be attended to, shanking will not trouble your vines.

I am, Sir, yours truly,

W. DENYER.

LANDSCAPE GARDENING.

LETTER THIRTEEN.

THE admirer of rural scenery enjoys a continual feast while residing in the country in the early months of summer. The progress of vegetation is so strikingly observable on every rising morn, that it adds fresh charms to every object of the garden and field. Were I to fix on any period of the revolving year at which the beauties of the vegetable kingdom are in the greatest abundance and variety, I should say between the twentieth of May and the fifth of June. Within that

period many of our finest trees, most ornamental shrubs, and thousands of our most interesting herbs, are then in their highest floral livery. The flower-garden is then delightful, whether we explore the beds or borders, or look upon the surrounding shrubberies, or the loftier trees beyond—all present a richly varied scene of beauty. From the humble daisies and violets under our feet, up to the lofty and wide-spreading head of the horse-chestnut, there are gradations of every tint and every hue. The rhododendrons, kalmias, and azaleas of America, Europe, and Asia; the syringas, cytissuses, and viburnums, &c., are all in most gorgeous attire; and such as are not yet fully in flower, are all promising to add to the general bloom. If we turn into the kitchen-garden, we see it yielding many of its choicest delicacies; or if we walk into the fields, the fresh verdure of the shooting corn cheers the eye, and swells the heart with hopes of abundant harvests. This season of the year is not only the most lovely to the eye, but the most gratifying to the mind;—every thing appears advancing to perfection, the view of which generates the most pleasing ideas of success and enjoyment. Many concomitant circumstances serve to enhance the pleasures of it: a milder and refreshing atmosphere—the music of the groves—the bleatings from the hills—the lowings from the meads—altogether form a concert of rural sounds and rural joy most delightful to the contemplative mind.

It is a matter to be regretted, or rather to be wondered at, that in this country a great majority of those who possess the most beautiful estates never visit them at that season when they are most delightful to behold. The charming season of spring is absorbed in parliamentary duties, or in the fashionable assemblies of high life in the metropolis; and it is the custom of many families not to see their country-seats till all vegetation is on the wane. Autumn, no doubt, has also its charms in the enjoyment of many products—in the view of the mellow-tinted woods, so interesting to the poet's or the painter's eye; and the spirit-stirring excitement of the chase is by many valued higher than all other pleasures of the country. But though all these add to the enjoyments of the season, they cannot be compared with the soul-expanding impressions derivable from a view of nature in the spring.

It was on a morning towards the end of May when I had the pleasure of accompanying my friend on horseback to visit the magnificent seat of —— Court. The day was delightfully fine, and the road lying through a richly-cultivated and well-wooded country, the scenery on each side was of the most pleasing description. Farm-houses, with their surrounding buildings and orchards, and rectangular well-fenced fields clothed with promising crops, some of them accurately drilled,

and all looking extremely well, were scattered over the face of the country; and little groups of cottages, with ivy-covered gables, ranged on the margins of green commons, or crowded round the modest parish church, enriched the landscape in every direction.

After a pleasant ride of an hour and a half, we approached our destination. This was anticipated by observing an extensive mass of oak woodland inclosed by an ancient wall, which trended away to the right and left out of sight. Before us was the grand entrance into the park, which is entered through massive and curiously-wrought iron gates hung between square stone columns, surmounted by lions rampant supporting shields, on which were emblazoned the family arms.

The porter's lodge is on one side, within the wall, and is a roomy building, covered with a steep roof of thick grey slate, with dormer windows, ornamented gables, and twisted chimney shafts. Both the gate and lodge give an idea of massive amplitude, which idea is well kept up as we proceed into the park. The park itself is extensive, and all its features are on a magnificent scale. The groves on each side of the approach, for a considerable distance inwards from the gate; are immense aged oak trees, many of them in a state of decay; but notwithstanding this, their venerable appearance adds an air of dignity to the domain. Many of them are covered with ivy to the very top; and though this ever-verdant climber appears like an encumbrance on its aged supporters, the union evinces a connexion of many by-gone years.

Proceeding onwards we arrived upon the brink of a brow which commands an extensive view of the park and mansion-house, seated on an opposite brow at the distance of half a mile. From the point at which this view opened to us, (and at which we stopped for a few minutes to survey,) it was easily discernible that an avenue of oak trees had, at some former time, connected the entrance-gate with the front court of the mansion, because, although its continuity and close array are broken by the advice of some recent improver, the trees that are left show plainly the ancient ranks of the avenue.

This dismemberment of the old avenue is certainly an improvement, because, in the first place, it visibly divided the park into two parts; and the lineal arrangement of the trees in the avenue were in every respect unlike the natural disposition of those on each side, which appear to have been originally scattered about by the hand of nature.

As the avenue was dismantled as an object of ornament, and abandoned as a road or approach to the house, a new approach has been formed in a curvilinear direction to the left, first descending and afterwards ascending towards the left-hand angle of the mansion. This

line of road is well designed, as every part of it seen in advance evidently trends in the direction of the house ; and as from the point or situation whence it is first, but only at intervals, seen, it is rather graceful than otherwise ; and as the direction is diagonally down one slope and up the other, the labour for carriage horses is rendered easy.

In riding along this approach, many interesting glades become open to the view on either hand. These are not narrow vistas, but wide, spacious openings between the equally extensive masses of wood : the whole has an air of grandeur, as well from the amplitude of the features themselves, as from the objects composing them. A very large stock of deer is kept, and these being seen in various groups scattered over the park, serve not a little to enrich and give animation to the scenery.

Except immediately in front, the mansion-house and offices are embosomed among stately trees, of which a numerous colony of rooks have seemingly long had possession. I mention this trivial circumstance, not because it is peculiar to this place and no other, but that the incessant cawing of those clamorous birds convey a somewhat higher idea of an embellished rural residence than we otherwise should have. This impression arises from the frequency with which we witness rookeries in high trees near the habitations of man ; the first for safety against climbing animals, and the second to avoid the persecutions of their natural enemies, the raven and crow, which seldom allow them a peaceful abode to nestle in distant or lonely woods.

Though rookeries are common in almost every place where there are high trees near country-seats, there is, however, here a colony of birds, which colonies are by no means plentiful in Britain. This is a *heronry*, and at no great distance from the house ; and its existence is a proof not only of the stateliness of the trees, but of their antiquity, because herons rarely shift their quarters, especially if near a river, which is the case here. As they are such old residents, and an ornament to the place, the keeper takes special care that no sportsman or bird of prey annoys them.

On arriving at the house we dismounted, and entered the front court of a noble old Elizabethan mansion, consisting of a centre and two wings of two stories. The principal entrance is under a square tower of three stories, surmounted by pyramidal turrets at the angles, and a balustrade parapet. The same kind of parapet is carried along the eaves of the centre and the two wings. The gables of the latter are highly ornamented, having bay windows, &c. ; and in the centre of each wing there are square projections, each containing bay windows,

one above the other, in many ornamental compartments, similar to those over the main entrance. At each end of the centre part of the house are square towers, somewhat lower than the middle one, and covered with pyramidal slated roofs bearing large gilt vanes.

The whole exterior, from the amplitude of the parts respectively; has an imposing effect; nor are the apartments within less striking from their spaciousness, the massive grandeur of their fittings-up, and ornamental finishings of the ceilings, cornices, and panelled walls. The baron's hall, of "grey renown," is a noble room, splendidly decorated with the portraits of the former possessors of the estate, and with the real coats, and arms, and banners of some ancestors who distinguished themselves in the wars between the rival houses of York and Lancaster.

The library is also a spacious room, and contains many thousand volumes, very accurately classed according to the subjects of which they treat. One compartment contains divinity, another British and foreign law, another history, and so forth. Here there are also cabinets with glazed fronts for objects of natural history, for optical and mathematical instruments, recesses for globes and maps, &c. &c. The picture gallery extends nearly the whole length of one of the wings up stairs. There is also a fine collection of paintings by the old masters hung about in other apartments, all of which are on the same magnificent scale.

His Lordship, whom we luckily found at home, and disengaged, received us with the utmost cordiality, and after an hour's conversation, ordered his horse, kindly offering to ride with us round the outskirts of the park.

We could not have had a better conductor, as his Lordship not only led us through those scenes which he himself considered the most interesting, but also described what alterations had been made in his own time, and in that of his uncle, whom he succeeded.

On leaving the house, I observed that the domestic offices formed a large square court behind the mansion, thickly environed with forest trees; and still farther in the rear, his Lordship told us the gardens formerly stood; but that, "about four-score years ago, it became the fashion to dislike kitchen gardens near a house; and to comply with the reigning idea, and the decrees of the then arbiters of fine taste, my good uncle, in an evil hour, consented to the demolition of the convenient old garden, and removed it down into that hollow on the left, which we shall see more of presently. My uncle very soon repented of what he had so precipitately executed; and I have had much cause to regret that my garden, in which I always take delight, is so far

from my house. I consulted," added his Lordship, "the late Mr. Ripton on the matter, and his advice was, that the whole be removed back to the very spot where it had originally stood."

By this time we had gained the summit of a rising ground which overlooked the gardens and the valley in which they lay. They appeared to be extremely well laid out, in a rectangular form, walled round, and encompassed by a plantation of evergreen shrubs and forest trees. A range of hothouses extended across the upper end of the garden, and at the lower end, on the outside, was a small greenhouse or conservatory, surrounded by an irregular flower-garden. On one side, near the top, stands the gardener's house, with a melon-ground and orchard in front. The whole is enclosed by a lofty hedge and deep ditch impassable by, and impenetrable to, deer or other cattle.

It was not alone the distance the gardens lay from the house which his Lordship complained of, but of its greater liability to the visitations of night frosts in April and May; for though perfectly sheltered from wind, and on rather a rich spot of land, there is always more humidity in such situations, and consequently a lower temperature. This circumstance I have alluded to in a former letter; but it is so often disregarded in fixing on a site for a garden, that it can hardly be too often repeated.

It is not easy to guess what good reason could be adduced for banishing the kitchen-garden from the near neighbourhood of the house. No one, it is true, would wish to live among leeks, onions, or cabbage; but there is no necessity for this in any supposable case. An owner need not be condemned to walk through his kitchen-garden, neither should he be debarred looking at his culinary vegetables and fruit-trees, if so inclined. A well-designed and neatly-kept kitchen-garden is as gratifying to look at as the gayest parterre, although it be a gratification of a different kind.

Pursuing our ride, we passed through a diversity of scenery, chiefly owing to the inequality of the surface. There are no hills certainly, but there are many beautifully winding hollows of considerable depth, which, being finely wooded on the sides, have a very striking effect when viewed from below.

The woods, as their distance is increased from the house, assume more the character of forest scenery, there being much undergrowth of wild shrubs and self-sown young trees, forming together the most interesting and picturesque groups. The closely-nibbled portions of verdant turf which surrounded and flowed among these groups and detached parts of the wood, are as varied as possible, and ever forming the most pleasing combinations. This was, indeed, just such wood-

land scenery as a painter would have been delighted to study and to depict. There was no mark of artificial regularity—no right lines—no circles, or other regular figures; all was the effect of time and accident. Majestic trees were associated with some of their own stripling progeny, and these accompanied by tufts of blooming furze and broom. The intricate play of the intervening turf, the various altitude of the trees, and the gradations of higher and lower thorns, holly, and juniper springing from among the decayed and living ferns, formed in all directions scenes which, when enlivened by the bounding deer, were worthy of a Gainsborough's talent.

Of this description of scenery a very large portion of the outskirts of the park consists, and is, indeed, extremely interesting to those who possess a painter's eye, and who can appreciate the beautiful associations of Nature in her wildest state.

Many writers of the most refined taste, and who have acquired that taste by the study of the principles of painting, as exemplified in the works of the great masters of the landscape branch of that divine art, have long ago insisted that landscape gardeners should, in all cases, copy as far as possible the scenery (sylvan particularly) as represented by the ancient fathers of the pictorial art; or, if they have no access to the galleries of the great, to become acquainted with the works of Rembrandt, Poussin, or Claude Lorraine, then they should repair to the New Forest, where the late ingenious Mr. Gilpin caught and matured so many of his ideas of forest scenery; or to that at Epping, or any other forest, to study the various combinations of trees, shrubs, and herbs, which might be successfully imitated, not only among the greater features of a park, but in the pleasure-ground, and even in the flower-garden also.

(To be continued.)

ENTOMOLOGY.

NOTICES OF INSECTS DESTRUCTIVE IN GARDENS, AND OF A FEW BIRDS WHICH ARE INSECTIVOROUS.

(Continued from page 211.)

THE larvæ of many kinds of butterflies and moths are very injurious by devouring the foliage, and to such an extent that both flowers and fruit are destroyed. Every one has to complain of the depredations committed by the gooseberry-moth, the larvæ of which defoliate the trees, and render the fruit austere and almost useless. Those of the

vapourer moth (*Orgyia antiqua*) feed on and disfigure the leaves of almost every kind of plant they happen to alight upon. The little grey moth, so numerous on hawthorn hedges, also attack apple-trees in orchards and gardens, devouring the leaves and covering the twigs with their webs. The tree lackey-moth (*Chysiocampa neustria*) are bred on apple-trees, gnawing the young leaves, which serve them for food till they assume the chrysalis state. As the caterpillars congregate in webs, they are easily caught and destroyed by hand. The insect (*Lozotania rosaria*), so destructive to the foliage and flowers of rose-trees, are a great plague to florists, as they often totally destroy every bud on a favourite tree. These insects (the *Lozotania rosaria*) are much more destructive, because more numerous, in some seasons than in others, and to one variety of rose more than others, or in one locality more than another. In some places, very few of the first rose-buds ever come to be perfect flowers, owing to the insect eating its way into the very heart of the bud long before it begins to open. In the present year these rose-eaters do not appear to be so numerous as usual, as there is at present a fine prospect of a plentiful bloom.

But to revert to the caterpillars above named, and to many others which we cannot scientifically designate, and which are equally annoying to the gardener; of them we have to notice that many different methods have been recommended for driving them from their prey. The most ancient, perhaps, is fumigation, by the combustion of half-dried weeds, or litter of any kind, burned on the windward side of the orchard or garden. This as a preventive may be in some degree effectual, as it seems that these tribes of insects have very keen senses of both taste and smell, and, therefore, easily annoyed by any noxious vapour, though not suffocated. But, in the open air, neither smoke nor vapour of any kind can be directly applied nor confined, except on small plants, and, therefore, fumigation can only be but partially effectual in banishing or destroying insects. The effluvium of soot laid under the trees is found to be offensive to all those insects which are on the wing in search of sweet or aromatic food; and many offensive decoctions of bitter, or otherwise offensive, plants, have been tried as repulsive expedients, with more or less or no effect. But in all applications of this kind, the time *when used* is material. If the parent insects can be disgusted, by any dilution thrown upon the trees, from choosing these as a cradle or nursery for their young, it would be well, because they may be perhaps easier kept off than removed after they are seated. Among other things, it has been advised to wash gooseberry-trees, soon after they have got their leaves, with the water in which potatoes have been boiled, which is said to prevent the attack of insects. Some recommend striking

the branches smartly with a stick, to cause the caterpillars to drop on the ground, and then immediately digging the ground to bury them. But many practical men insist that there is no better plan than hand-picking and killing the insects at once, as is done in the case of earwigs.

On the subject of warding fruit-trees and other plants from the depredations of insects, we have yet much to learn. When the economy of our commonly destructive insects is better known, discoveries may be made that will extend the power of the gardener and farmer against their common enemies, and which will be of the greatest advantage to both. The Entomological Society of London is now directing its views to this application of the science, and the best results may be expected from the united endeavours of the members.

Very closely connected with the depredations of insects in gardens, are those committed by the feathered tribes. For as every insect seen about a plant is condemned as an aggressor, so many birds while busily employed in the service of the garden, are ruthlessly scared, robbed of their nests, or relentlessly slaughtered with the gun.

On this subject we have lately seen an excellent article in the *Quarterly Journal of Agriculture* for this present month, from which we will make a few extracts.

"As our subject," says the writer, "naturally divides itself into three parts, inasmuch as birds are decidedly destructive, partially destructive, or not destructive at all, though alleged to be so, it will be convenient to treat the three kinds separately, beginning with the last, of whose habits and food gardeners and farmers (it is presumed) know much less than they do of the two first.

"At the outset it is necessary to remark, that many birds not in the least destructive to the ordinary crops of a farm, often commit considerable depredations in orchards and gardens: nay, the latter, so far from being injurious to agricultural crops, may prove of no little service, as we shall afterwards see. We may notice, first, insectivorous birds, which do not eat fruits or seeds; they are but few in number, and, like the larger carnivorous animals, are thinly scattered, with rare exceptions live solitary, and do not assemble in flocks.

"One of the most exclusively insect-eating birds, not uncommon in most parts of the empire, is the gold-crested wren (*Regulus cristatus*), the smallest of the birds of Europe. It cannot be mistaken for any other bird, being of a greenish-yellow colour, while the common wren is rusty brown with lighter bars and spots; and though the chaff-chaff and the hay-bird are yellowish-green, neither has the golden yellow on

the crown of the head which distinguishes this pretty bird. It delights most in evergreen shrubs and trees, particularly the spruce fir and cedar, though it is often found where there are but few of them, and even where there are plenty it never fails to make daily excursions along the hedges in the vicinity, flitting about through the thickest branches, and uttering its small tinkling chirp of *tee, tee, teechy*, at every change of position. It is not in the least afraid of being approached, most probably owing to its being very near-sighted, a peculiarity of vision no doubt designed by Providence for enabling it the more readily to distinguish the minute insects on which it exclusively feeds.

"No farmer would be apt to accuse the gold-crested wren of injuring his crops; but when a gardener, unacquainted with their habits and food, sees them flitting about among his espaliers, his wall-trees, or his rose-bushes, he will be apt to think they are busy eating the blossom-buds, as some other birds are well known to do; while, on the contrary, they are doing him essential service, by picking up every straggling plant-louse (*Aphis*) and bud-weevil which they can meet with.

"The species which come nearest to the gold-crest in appearance and habits, are the wood-wren (*Sylvia sibilatrix*), and the willow-wren or hay-bird (*Sylvia flit*). The chiff-chaff (*Sylvia loquax*) also ranks with these as an insect-eating bird. All the three are greenish-yellow, darkest on the back and wings, and lightest on the breast and belly. Their chief food consists of small flies or small caterpillars, such as roll up the leaves of trees and shrubs, and particularly the rose-leaf roller or 'worm i' the bud,' together with the whole of most destructive species of plant-lice (*Aphides*). Where these birds are plentiful accordingly, they may prove of no little service to the farmer in thinning; on their first appearance, wheat-flies, the blue dolphins, the hop-flies, and the pea-plant *Aphides*. This is of great importance, for one of these insects killed on its first appearance will prevent the breeding of several thousands.

"Gardeners are even more prejudiced against the hay-bird in particular than farmers usually are, and, in some parts of England, it is opprobriously termed the *cherry-chopper*, from a notion that it devours the cherries. That this bird is frequently found on cherry-trees is most true, and may be seen in pursuit of the destructive cherry plant-louse, a species which is particularly injurious, commencing its ravages on the cherry-leaves about the end of April, when the hay-bird arrives to assist in preventing their increase. Neither cherries nor strawberries are ever tasted by these birds; and so far, then, from

persecuting and killing these birds, as some gardeners so frequently do, every means should be taken to encourage them to breed, by protecting their nests.

"The next friend to the gardener is the nightingale, whenever they resort to gardens, because they are also entirely insect-eaters, devouring great numbers of the caterpillars and grubs, as well as the moths, butterflies, and beetles, from which they are produced. Along with this may be ranked three pretty birds, called chats, viz. the whin-chat, stone-chat, and the wheat-ear; but these are field birds, and, therefore, only indirectly serviceable to the gardener. There are other field birds deserving the same character, as the pippets and wagtails, which, though living entirely on insects, seldom visit gardens.

"Insect-eating birds, which partially eat fruits or seeds. Those are principally the common wren, the hedge-sparrow, the red-breast, chaffinch, house-sparrow, black-cap, garden-warbler, and the greater and lesser white-throats. All these are insectivorous, but they will also greedily devour seeds and fruits: of the former, all those of the *brassicæ* tribe of plants, and of the latter all those called berries.

"Of similar habits, and in choice of food, may be ranked the tomtits, particularly the little blue one (*Parus cæruleus*). This is a prying, impudent, fearless little fellow, capable of subsisting where no other bird could find food, inasmuch as nothing comes amiss to him of an animal or vegetable nature, that he can peck into with his small black bill, as hard as horn, and as sharp as an awl. With this efficient instrument, he speedily breaks up the hard wing-cases of all sorts of beetles, and the envelopes of chrysalides and pupæ, and will, to get at these, dig into the bark of trees like the woodpecker, and also into their buds. This, however, so far from being a destructive, is a very salutary habit, for the tomtit does not, like the bullfinch, eat the buds themselves, but 'the worm i' the bud' within, discovered by a similar instinct to that by which the snipe discovers worms beneath the surface of the soil. Were the worm left in the bud, it would destroy it by eating out the core, and not only so, but, when arrived at maturity, would become the parent of a numerous brood of other worms to destroy other buds. Equally beneficial are the services of this bird in discovering and devouring the pupæ and chrysalides in crevices and chinks of the bark of trees, like the creeper (*Certhia familiaris*), for nearly all such found in these situations are from caterpillars, which have fed on the leaves, and, of course, would give origin to similar caterpillars, were they permitted to undergo their transformations.

"The other tits, as, the greater, the cole, and marsh-tits, are all chiefly insectivorous, but will also eat farinaceous seeds, as, those of

sunflower, or peck a bit of ripe pear or apple; but such damage is very trifling, and is a reward which should not be grudged, considering the great good they do both to the gardener and farmer."

We have added these few remarks on useful birds in gardens, as connected with destructive insects, as showing how much those little creatures assist the gardener in freeing his trees and plants from noxious insects, and in order that he may know his friends from his enemies, which are often confounded with each other, and suffer indiscriminately.

MISCELLANEOUS INTELLIGENCE.

REMINISCENCES OF A VOYAGE TO AND FROM CHINA (*continued from page 220*).—The ships composing the fleet in which we returned to England were ordered to assemble at Macao; and when all had joined, the next day was appointed to weigh anchor, homeward bound. The fleet consisted of twenty-eight East India Company's ships, the *ARGO* British ship of war of forty-four guns, a large Spanish frigate, and a heavy Portuguese ditto, all under the command of Commodore Sir Erasmus Gower, of the *LION* sixty-four gun ship of the line.

The fleet sailed in two lines, the foreign frigates leading, with the Commodore in the centre, and a little in advance of the whole, the *Argo* bringing up the rear. Thus stationed, and favoured with a fine breeze, we sailed southward down the Chinese seas.

The day we bid adieu to the coast of China was undoubtedly the happiest we experienced during the whole trip. We had got a fine assortment of plants, and of the very kinds we had come so far in quest of; they were all in high health, and so placed that no ordinary accident likely to happen on board a ship, either in working the vessel or from wind or weather, could befall to prevent their safe transport to Europe. We pictured to ourselves the high gratification which would be felt by our worthy employer, to find himself at last in possession of plants which he had long wished for, and spent much money to procure. We anticipated the congratulations with which we should be received by our personal friends on our return, with such an unique collection of Chinese rarities; in short, we considered that the most important and agreeable adventure which could be undertaken by a young enthusiast, was already in a great degree accomplished.

The heat of the weather previous to and at our departure from China, ranged between fifty and seventy degrees, the sky generally

cloudy, with light drizzling rain, which was particularly favourable to all the so-lately-shifted plants;—every thing was so far propitious.

Our passage down (as it is called by navigators) the Chinese seas was quick, having a fine leading wind and clear tropical sky—the temperature daily increasing as we sailed nearly southward.

Every one in the least acquainted with vegetation will readily conceive that this sudden and unnatural increase of heat affected the plants most seriously, by exciting them into premature action, and therefore it became our duty to check this early growth by every means we could devise. The freest-growing plants had the points of their shoots pinched off, and these at the same time were kept rather dry. The pæonias showed many flower-buds, but, lest they should be weakened by blooming, the whole were cut off but one on each plant. The camellias had several flower-buds unexpanded; but these, soon as they felt a warmer sky, together with the confined air of the boxes, dropped off before they were expanded. The azaleas were extremely affected; their attenuated spray crowded with flower-buds, expended, as it were, every drop of sap in the branches, and much more than the enfeebled roots were able to re-supply. Shading in the middle of the day, and frequent sprinkling over-head, were considered necessary, and were constantly bestowed.

The night air was deemed peculiarly refreshing to the plants, and this cost us many all-night watches to afford; for if a squall happened in the first, second, or even in the morning watch, the platform must be closed down, lest the men might have occasion to use it in making or taking-in sail. Regular watering was always bestowed, according as the plants individually appeared to require it; and if any of the baskets or pots became saturated or soddened, the moss was removed and the surface stirred up.

This narrative is defective in not being accompanied with dates to most of the occurrences. The fact is, we destroyed our daily memorandum-book many years ago, and at a time when we had not the most distant idea that ever an extract from it would be useful; but, from occasional remarks in other books in our possession, we find that in three days after leaving Macao, the heat, as indicated by the thermometer under the awning of the quarter-deck, was eighty-seven degrees, and never fell below seventy-five till we were approaching the Cape of Good Hope, nearly two months afterward.

This was the first and severest trial the plants had to sustain, more especially as every day brought us nearer the equator; and on nearing the coast of Borneo, and in a day or two afterward, coasting along the

Island of Banca, the weather became exceedingly changeable, with frequent squalls and dreadful storms of thunder, lightning, and heavy rain. Here our collection on the poop required constant attention night and day ; for with every change of weather, some change or other it was necessary to make in the covering of our floating greenhouse, either to protect it from a deluging rain, or fierce sunshine, or from destruction by the treading of the seamen.

About the 3rd of April the whole fleet anchored within a small islet on the north-east coast of Sumatra. The former is called North Island, from its position with regard to the latter, and is a place usually touched at by homeward-bound East Indiamen, to replenish their empty butts and take in fire-wood, if necessary. We went on shore with the watering-party at this place, but met with nothing remarkable, or different from what we had formerly observed in the various places at which we landed in the Straits of Malacca. Like the other parts of this vast island, it is thick jungle almost to the water's edge ; a sandy beach, and a small space round the mouth of the rivulet where the fresh water is got, is all that is clear. A creeping convolvulus (*C. hirtus* ?) covers the loose sand thrown up by the waves, and the jungle is impenetrable to a stranger ; and even where there are openings, it is dangerous to venture far, as the prowling Malays are always upon the watch for straggling Europeans, whom they will murder for the sake of robbing them of their clothes. The embassy touching here on the voyage out lost one of the artisans, who had stopped for a few minutes behind the party to bathe.

Although we made no addition to our collection at this place, we had leisure enough to consider well the state of the plants, and to do every thing that was necessary to preserve or restore the sickly individuals, by examining the state of their roots or changing their berths. Some were removed from the poop to the stern balcony, and others brought from thence to the poop ; all were divested of dead or dying leaves and shoots, and every thing done to keep them under the most favourable circumstances of exposure, shade, and refreshings of water. But here first occurred to us the *sickening apprehension* that transporting Chinese plants in safety was not so easy an affair as we fondly imagined when we left Canton. Many were in an extremely exhausted state ; and when we looked forward to the inclement clime of the stormy Cape, through which they had to pass, we trembled for the fate of many of our suffering favourites !

We were quite aware, however, of the cause or causes of their failure. We had several indices before our eyes, which plainly pointed to the defects of our management, or rather to the unfavourable cir-

cumstances under which we procured the collection, and the subsequent influences to which they became exposed. All those which had *not* been removed from the pots in which they were purchased, were comparatively healthy, while those which had been raised from the open ground, or which had been shifted into baskets before coming on board, were in a feverish state of excitement, and evidently much exhausted. By preparing them for the voyage, their roots necessarily suffered some disturbance, though no positive violence; and before these had recovered their wonted activity, they were launched, as it were, from the edge of the temperate, into the midst of the torrid zone in the course of a few days. This was more than the so-recently-shifted plants were prepared to withstand; nor with all our means, and skill, and constant care, could we check their restless efforts to waste their natural powers.

There was still some hope left to cheer and dispel our anxious forebodings;—we should shortly be under more temperate skies in crossing the Indian ocean, and we trusted to our well-designed means of protection to double the Cape of Good Hope with safety.

While in this sultry clime, and within a degree or two of being under a vertical sun at noon, in latitude one degree south; (the north declination being at that time very trifling,) we often thought of the advice given us by the experienced Sir Joseph Banks. He said that “a person, however voluntarily ardent in the pursuit of any object while in the temperate latitudes, feels very different when exposed to the great and relaxing effects of tropical climates; a kind of lassitude seizes the most determined spirit, and for the love of ease ordinary duties are often neglected from the pain and dread of exertion.” To lie stretched out in some quiet and shady situation, is the greatest luxury; and no native of a cold climate can have the least idea of how much the energies of the human frame become neutralised under the all-pervading solar heat as felt at North Island.

For ourselves, we may confess that we were no more free from such infirmity than others; but as our exertions were never required to be long continued under a burning sun, they were performed with greater alacrity. On this score we had, at the end of the voyage, nothing to upbraid ourselves.

From this anchorage the fleet weighed, and stood to the eastward across the straits of Sunda, which divides the islands of Sumatra and Java, and anchored again at Angora Point, a roadstead nearly opposite the town of Bantam, at the western extremity of the latter island. Here we went on shore, and spent a pleasant day with Mr. Haxton of the embassy, ranging about in the woods and among the enclosures of

this rather populous spot. We met with no new plants; but Mr. H., who was a good entomologist and collector, captured some splendid insects: among the rest, we remember particularly an enormous green spider. Many tropical plants were well cultivated here; among others, indigo appeared to be a staple article. The proprietors were Dutch settlers. Here we met two or three Spanish and Portuguese Catholic missionaries, whose destitution and squalid appearance was truly pitiable. "*Pour l'amour de Dieu*," they said, they submitted to every kind of privation, and could but with difficulty exist in a place rich in vegetable products certainly, but insalubrious, and where they could make but few converts.

Sailing from thence about the 9th or 10th of April, we steered a nearly south-west course towards the Cape of Good Hope. The voyage through among these Oriental Isles which we had just left, was most interesting; every island, from the exuberance of vegetation with which it was clothed, seemed a paradise. The clear deep blue of the unclouded sky, and the equally deep tint of the sea in those parts, added to its extreme transparency, enables the eye to explore the coral rocks of many various colours, and the fish disporting among them at a great depth. But such placid seasons are of short duration, for soon vast masses of electric clouds are formed, lightnings flash, and thunder rolls. The sudden squall, if unheeded, rends the canvass from the yard, and drives the ship from her course; but in a few minutes, perhaps, all is again calm and serene.

In this "war of elements," with the heat averaging about eighty-eight degrees, our already enfeebled plants became still more feeble; and happy, for their sakes, did we feel while bounding away from the excitable incidents of heat and humidity so common in that part of our voyage.

When we had proceeded as far as the thirty-second degree of south latitude, several of the camellias and magnolias were dead nearly down to the graft, and many had lost their leaves; but we were pleased to observe that some of them began to produce shoots from the lower parts of the branches, which we considered a good sign, it being a proof that the roots were in action; and if they could continue to supply as much moisture from the soil as was exhaled by the warm air, the plants might eventually survive. Here we also observed that the youngest plants suffered most—those having the most substantial stems and branches bearing the changes of weather without so much injury.

In passing the isles of Rodrigues, Mauritius, and Bourbon, we were visited by some heavy gales of wind, which dispersed the fleet and delayed our progress. In these cases the seamanship of the com-

manders, and the trim of the vessels, were very apparent. While the King's ships and the greater part of the Indianmen were close-hauled to windward, the foreign frigates were gone many miles, sometimes out of sight, to leeward ;—of course the whole fleet had to proceed under easy sail till these ships regained their stations.

These gales were only a foretaste of what we had to expect in doubling the Cape in the depth of winter ; and unluckily, when we were approaching the longitude of that place, the wind was contrary. We were delayed ten days beating round the Cape, sometimes stretching as far to the southward as the thirty-ninth degree of south latitude, where the thermometer fell to fifty-five degrees. But what was worse for our invalid charge, we encountered two tremendous gales, in which all the ships had to lay-to—once for two days and nights together, and during that time was constantly drenched with heavy rain, or pelted with violent storms of hail ; at the same time a heavy spray was dashed every minute over every part of the ship, and the vapour raised from the frothy crests of the waves by the wind pervaded every opening about the ship.

Under this ungenial state of the weather, the plants were closely shut up, the weather-curtain being constantly kept down—air being given only on the leeward side.

When the fleet had weathered the Cape and taken the direct course to St. Helena, the weather became moderate and very fine. We eagerly exposed the plants, to see what changes had taken place. We found that during their confinement many of the leaves had fallen, or were withered either by the cold or spray. There were no signs of improvement : and it became perfectly obvious, that as there was still a three-months' voyage before us, there were but feeble hopes that more than one-half of the whole number would ever reach England alive. They had yet another fiery ordeal to pass through ere they reached their destination, and there was but little chance that they could be recovered by the same means and care which had been but too ineffectually bestowed during the early part of the voyage.

In this, to us, distressing view of the case, and even at that time, we immediately began concerting measures for a second voyage to China on a similar errand. From the instructions we had left with the old gardener at Canton, we were convinced that he would immediately set about preparing a collection of desirable plants in pots, to be thoroughly established therein before they might be called for by the next purchaser ; and we also left with him a long list (written in his own language by a very clever linguist whom we employed) of seeds which

were wanted in Europe—many of them fictitious certainly, but by getting what he might conceive them to be, some good things might by such means be accidentally introduced to our collections.

The hope of returning once more to China was a pleasing dream, and was some consolation to us under our then uneasy feelings of disappointment. We had, however, still some good things under our care, and we could only continue to treat them in the same manner as we had hitherto done.

The fleet was now proceeding gaily and rapidly towards St. Helena, wafted by the south-east trade-wind, and under a beautiful sky sprinkled with light fleecy clouds. On the evening of the 18th of June, the last signal made by the Commodore was to *shorten sail during the night*. “Right,” said our commander, when he ordered the signal to be answered in the affirmative;—“right, because we shall be at anchor before ten o’clock to-morrow morning.”

(*To be continued.*)

OF THE RELATION OF VEGETATION TO SEASONS. *Extracted from the part BOTANY, published under the superintendence of the Society for the Diffusion of Useful Knowledge, attributed to the pen of Dr. Lindley.*

“Repose from growth seems periodically necessary to most plants, and accordingly we find there is no country without a season of growth and a season of rest, whether they are called by the name of winter and summer, or rainy season and dry season. This fact is connected with several considerations, to which it may be necessary to advert. What is about to be said has reference to the seasons of the north of Europe: it is left to the reader to apply the observations to the climate of other parts of the world.

“In the winter, we commonly say that all vegetation is at rest—that the sap ceases to flow, new parts to be developed, and old parts to enlarge; but this is not exactly true. It appears from experiment that vegetation is at all times more or less active, and that we ought to say that it is languid in winter, and energetic in the spring and summer. The fact of many plants retaining their leaves, of others swelling their buds, and of all forming an addition more or less considerable to the points of their roots during winter, sufficiently attest the movement of the fluids, and the existence of vegetation even at that season. This is further proved by the well-known fact, that trees planted in the autumn become turgid with the fluid absorbed by their roots during winter; and a M. Biot has succeeded in obtaining a

flow of sap from certain trees, even in the midst of that dreary season.

"But whatever power of attracting sap by its roots a plant may possess during winter, it is obvious that it has little means of parting with any part of it again by evaporation at that period of the year ; so that during the winter the whole of the tissue must gradually acquire a state of turgidity, which will go on increasing till the leaves and new branches are developed to carry off the sap, or decompose and assimilate it.

"This turgid state is eminently favourable to rapid growth when vegetation once resumes its activity; for it acts as a force from behind, which continually presses upon the new-born tissue, and causes it to expand. It is well known that after very long winters, or when a plant has been prevented by artificial means from shooting at its usual season, its branches and leaves are developed with extraordinary vigour—a circumstance which has been ascribed to *accumulated irritability*, but which is, in fact, owing to the turgid state of the tissue.

"It is when the temperature of the air is raised sufficiently high, that the vital energy of a plant is excited, and buds are developed with their leaves. Light has certainly nothing to do with this phenomenon, although it afterwards colours and consolidates the young parts; for if a plant be exposed to an elevated temperature, in total darkness, its growth takes place as if in the light. The common experiment of introducing into a hothouse the branch of a vine growing in the open air, is another familiar illustration of this fact: the temperature of the hothouse excites the buds into action, they immediately attract fluid from beneath them, and thus the whole system is put in motion, although the vine-plant may be exposed beyond the house to all the inclemency of the winter. De Candolle has proved by a simple experiment, that in such a case as this, the fluid consumed by the young leaves is really attracted out of the earth, and not absorbed from the atmosphere of the hothouse. If you select a tree with two principal branches, and two principal roots to correspond with them, and adapt to each root in the earth a bottle of water, you will find that the bottle which corresponds with the branch in the hothouse will be quickly emptied, while that which is connected with the branch in the open air remains nearly full. It may be supposed that in a natural state of things, a corresponding effect is produced upon the roots by the warmth of the surface of the soil, and that they also are stimulated into activity; but it is doubtful whether this amounts to much, if, indeed, it is of any importance whatever; for provided only the earth is not frozen,

it appears from experiments that heat applied to the branches alone, is quite sufficient to determine and maintain all the phenomena of growth.

"Once set in action, the branches of a tree go on growing according to the laws which have now been explained. They and their leaves, by degrees, gain their full growth; bark and wood separate, and cambium is deposited between them; the leaves decompose the fluid they receive, send their fibres down within the substance of the branches, gradually secrete the substance peculiar to each peculiar species, and transfer them to the bark; and, finally, becoming clogged at every pore by the earthly and carbonaceous matters that are deposited during the processes of digestion and evaporation, cease to act efficiently as leaves.

"In this state, they are principally protectors of the young buds in their axils. If the latter have been formed very early, they are so far advanced in their growth by the middle of summer, that they have already arrived at the same state as later-formed buds will be in at the commencement of another spring. Acted upon by the temperature of the season, they develope and call into play the same class of phenomena as took place in the beginning of the spring; the sap which had become languid as the leaves became impotent, is again stimulated to a rapid movement, and is secreted anew in increased quantity. This is indicated by what gardeners call the running of the bark—that is to say, the bark and wood of exogens separate spontaneously as in the spring, depositing a layer of cambium between them. Thus are formed what are called midsummer shoots, which only occur in plants which bud very early in the spring.

"In the course of the autumn, the increased and prolonged heat and drought complete the destruction of the leaves, which had already begun to languish; and their vital actions are destroyed by the quantity of foreign matter with which their cells, their stomates, their vessels, and their intercellular passages are filled, and they drop off.

"At this time a plant is nearly exhausted of its fluid sap, the watery portion of which it had exhaled during the summer and autumn; all the parts are dry and solidified, so as to suffer little from evaporation; and the roots themselves, having for some time been but feebly in action, are firm and not liable to be easily broken; every thing is in a state of languor, and prepared to renovate the enfeebled powers of the plant by the slow and gradual absorption of fluid during the winter.

"It is in the autumn, then, that both theory and practice direct us to transplant trees. At that season every circumstance concurs to render

the operation practicable; but if we wait till the spring, the spongelets which form during winter are likely to be destroyed, and many causes may call the already turgid plant into growth, before the roots have had time to form new spongelets.

"The seasons of growth and repose are so essential to vegetation, that, as is familiar to all gardeners, it is scarcely possible to prevent plants preparing themselves for their annual changes, whatever artificial means may be employed to maintain them in a uniform atmosphere, and to protect them from those causes which usually bring about repose; and this is certain, that if we can succeed in preventing the cessation of growth, the plants which are the subject of the experiment uniformly, in the end, fall victims to the forced and unnatural condition in which they are maintained.

"If annual changes in their condition be requisite to the well-being of plants, so in like manner are the diurnal changes of light and darkness. If plants were kept incessantly growing in light, they would be perpetually decomposing carbonic acid, and would, in consequence, become so stunted that there would be no such thing as a tree, as is actually the case in the polar regions. If, on the contrary, they grow in constant darkness, their tissue becomes excessively lengthened and weak, no decomposition of carbonic acid takes place, none of the parts acquire solidity or vigour, and finally perish. But under natural circumstances, plants which in the day become exhausted by the decomposition of carbonic acid, and by the emptying of their tissue by evaporation, repair their forces at night by inhaling oxygen copiously, and so forming a new supply of carbonic acid, and by absorbing moisture from the earth and air, without the loss of any portion of it.

"Such being the case, we must conclude that plants grow chiefly by day; and this is conformable to the few observations that have been made upon the subject. Meyer found the stem of a *Belladonna* lily, and plants of wheat and barley, grow by day nearly twice as fast as at night; and Mulder states that he has arrived at a similar result in watching the development of other plants."—*Botany*, Part IV., p. 98.

[As we have had, and shall have, frequent opportunities of descending on the growth of plants for the instruction or amusement of our readers, we think it right, as very different opinions are held thereon, to glean from every respectable quarter the ideas entertained or promulgated by each, in order that steady and rational views may be acquired of vegetable phenomena, which may be applicable to practical purposes.]—ED.

ON THE CULTURE AND MANAGEMENT OF FLAX CROPS.—(Although this is a subject of no importance to the great majority of gardeners, yet as it falls under the head of *rural economy*, which our plan of the *Register* embraces, we hesitate not to give an extract from an excellent article on flax culture, which appears in the last number of "The Irish Farmer's and Gardener's Magazine," just received.—Ed.)

"The ground should be so prepared during the autumn and winter, that it may in the spring be in the best state, and as fine as possible, in order that the seed may be evenly sown. The land should be ploughed as early as convenient in the winter; and if a wet soil, the furrows should be shovelled in the same manner as after wheat is sown; an eighteen-inch ridge is best in such soil. The ground should not be ploughed again in spring, but should be harrowed as if for clover-seed, and sown in the same manner. It should then be rolled immediately, if not very wet, but otherwise as soon as it is in a fit state. If the ground be not wet or subject to flood, it may be sown flat, and this mode answers best for dry or poor soils. An idea has prevailed that flax could only be cultivated with success after potatoes, but experience has proved that excellent crops may, with proper management, be likewise produced after wheat and oats, and may generally be expected where the ground is good and fresh.

"The seed should be sown as early as it can safely be done. The Dutch commence sowing in February, if circumstances permit. In Ireland, if the ground be in proper order, and the season favourable, not a moment after the first of April should be lost in getting the seed into the ground. Great ignorance and prejudice have prevailed as to the best kinds of seed. Riga, Dutch, American, and English, all answer well, when they have been properly saved [and not too much kiln-dried]. But the Irish cultivator of flax may always have at hand seed equally good, if not superior to any of these, if he will take the trouble of saving the seed. Seed is saved in the Netherlands as a matter of course, and even from the finest flax that is imported into these countries, worth one hundred and fifty pounds sterling per ton. The best seed is reserved for sowing, and the secondary descriptions for crushing, &c. The flax which obtained the premium from the Royal Dublin Society this year, was the produce of Irish flax-seed, without a change of seed for several years. It is advisable, however, to imitate the Dutch in this respect, and to change the seed every third year. They import Riga for that purpose. The precise quantity of seed should depend on the quality of the soil. Four bushels per Irish acre may be considered as an average quantity. If the ground be very rich and strong, four and a half bushels may with advantage

be sown ; but the quantity should be reduced as low as three and a half bushels per Irish acre for poor land.

“ The greatest attention should be given to the weeding of the crop, which should be commenced when the flax is about four inches above ground. The pains taken in this operation will be amply repaid by the result.

“ When the seed is perfectly formed, and has become of a brownish colour, the flax should be pulled and made into bunches, as much as a man can grasp in one hand ; but, in pulling, the hand should not go lower than within sixteen or eighteen inches of the ground, lest it should take up the short flax with the long. If the flax be suffered to remain beyond the time pointed out for pulling, it deteriorates, as the oily properties escape, an indication of which is given by the emission of an odour from the plant.

“ Six bunches, as described, should be laid on each other, viz. the first, straight on the ground ; the second, aslant across at the root end ; the third, in a like slant reversed across the second ; the fourth, in a like slant across the third ; the fifth, in a like slant across the fourth reversed ; and the sixth, straight along the whole to cover it. The seed ends should be toward the sun, and the root ends of all should be together, so as to be raised and to create a slope, in order that the rain may run off.

“ After remaining in this state to dry and harden, four, five, or six days, according as the weather may be, every six bunches of the flax, when dry, should be tied together loosely, in sheaves, taking care to keep that part of the flax outside which was on the ground. Eight sheaves should be formed into a stook, the roots downward ; and the stooks should be ranged in straight files, north and south, in order to have the full advantage of the sun and wind, and that their removal to the ripple or store may be facilitated. In this way it may remain eight, ten, or fourteen days, according to the weather.

“ When the flax is sufficiently dried, the rippling or process of taking off the seed should immediately take place. This may be done according to circumstances, in the field, in a barn, or other convenient place.

“ The ripple is an iron pin, about sixteen inches long, one inch square at the bottom, and gradually narrowing to the top. Sixteen of these pins should be set angularly, about one quarter of an inch asunder, in a block of timber four to six inches thick, eighteen inches wide, and sloped at each side, so as to let the boles [seed-vessels or capsules] fall the more readily upon the floor, or any canvass sheet, or

bag, that may be placed to receive them. In rippling, great care should be taken to keep the flax even, and not to suffer it to entangle.

"The safest mode of preserving the seed is to follow the course pursued in saving clover-seed in England, viz. to form a stack and put the seed in layers on clean straw until it be convenient to thresh it. The first layer of straw should be placed on furze-fagots or branches, and the straw raised at least a foot high thereon, before any seed is spread on it. The stack should be completed with alternate layers of straw and seed, and well thatched.

"After the rippling, the steeping process commences, and this is the most important process which flax undergoes, and that which is least understood in Ireland. The steeping-pits should be prepared in spring or early in summer, and the water should be kept stagnant therein in order to soften. They should be seven or eight feet wide, sloping to six feet at bottom, and from three feet six inches to four feet deep. In their formation or cleansing, a sufficiency of earth or mud should be thrown on the banks at each side, to serve as a covering for the flax in due time. If the quantity of flax be considerable, it may be found convenient to have a range of pits, separated by narrow banks, between, so that the water can be removed by a shoot from the pit wherein the flax is about to be first placed, into the adjoining one. The flax having, after rippling, been bound in sheaves, each as large as two hands can grasp, the sheaves are to be placed regularly in the steeping-pit (the water being previously removed therefrom), the root ends of the first sheaf to the end bank, the root ends of the second sheaf on the band of the first sheaf, the root ends of the third sheaf on the band of the second sheaf, and so on, the root end of every layer meeting the band of the former one; and all being in an oblique direction. When three layers are completed, a light covering of sedge, grass, or straw, should be put on the flax, and not less than four inches of mud on the grass or straw; then the water from the adjoining pit should be let over it, by opening the cross bank as far as is necessary, until the water, having filled the interstices below, rises over the mud, when the cross bank which separates the pit should be again made good. The mud should be well puddled, so as completely to exclude the light and air from the flax; and should any leakage subsequently occur, water should be supplied until it again rises over the mud. The proper time for steeping the flax varies from four to eight days and nights, according to the quality of the flax, the temperature of the weather, and the properties of the water and mud. The object of steeping is to detach or loosen the flax or bark from the pith or woody part, and the mode of

ascertaining whether this be effected or not is, by raising the bark near the root, and also about six inches therefrom, so as to break the wood at each place; and if the wood can be easily drawn out at the bottom, the steeping process may be considered as completed, and the removal of the flax from the pit should take place without delay.

“ This operation should be carefully performed with a fork: each bundle should be taken separately, and gently immersed in water, to cleanse it from mud, &c., and then placed on the cross bank or side of the pit to drain. After this, the flax should be carried to a meadow recently mown, or to some other convenient place for spreading. The bundles should be carefully untied, and the flax evenly spread in rows, observing that the inside of the bundle should be now most exposed. The time the flax should remain on the grass depends in a great measure on the weather, and may be estimated at from one week to a fortnight. It is of great importance that the spreading be equally performed, because, if the flax be put up in proper order, it will not be necessary to apply any artificial heat to it previous to scutching, which is not only a saving of expense, but a great advantage to the flax, as it thereby retains more of its oily properties. Previous to the removal of the flax from the field to the barn, store, or stack, it should be again made up into bundles of a convenient size. In this as in other operations, particular care should be taken to keep the ends of the flax even.

“ The last process which flax undergoes previous to its becoming a marketable commodity, is scutching, which is in Ireland performed by the hand, or at a scutching-mill. It is generally supposed here that scutching can be best performed at the mill; but this is a mistaken notion. In reply to frequent inquiries as to whether there were any scutch-mills in the Netherlands, the answer has been that there are none; and yet such is the admirable skill and attention of the industrious inhabitants, that they break, scutch, and prepare by manual labour flax, some of which, in its undressed state, they sell for upwards of two hundred pounds per ton.”

After giving an account of the culture and profits derivable from flax as an agricultural crop, the writer continues:—“ But there can be little doubt the increased stimulus which would be given by the advantageous results of improved management in the cultivation of flax, would greatly extend its growth over the south and west of Ireland, where the soil is admirably adapted for it; and as it has been clearly ascertained that flax is *not an impoverishing crop*, and, moreover, is peculiarly suited for laying down clover, it does not appear unreasonable to suppose that the extent of land under it in this country may be

more than doubled, and the national advantages derived therefrom proportionably increased.

"Ireland, from the climate, soil, the abundance of water she enjoys, and the extent of the population, is probably better adapted than any other country for the cultivation of flax, and the successful prosecution of the linen trade. If her sons do their duty, she cannot but take the lead of all other nations in this important manufacture."

L. C.

SIR,—I regret exceedingly to observe by the May number of the *Horticultural Register*, that your intelligent correspondent Mr. Burnham has expressed himself unfavourable to the formation of a Gardeners' Mutual Instructing Society; more especially as Mr. B.'s opinion must tend very considerably to retard its establishment. I had fondly hoped that the day was not far distant when we should have had something of the kind established amongst us, based upon proper principles, and regulated by efficient laws—for elucidating the science, and investigating the practices of our art; and that we should thereby be able in some degree to cope with the mechanics and other classes of operatives, who, in all parts of the country, possess such decided advantages over us, and who, to a certainty, are leaving us *far* in the rear in reference to literary acquirements. But I fear much that Mr. Burnham's castigations on the merits of the projected society will go far to thwart, at least for a time, the laudable objects which its projectors profess to have in view.

Mr. Burnham's primary objection, however, seems to be rested upon the supposed impracticability of such a society, from a consideration of the pecuniary debility of the profession; but this ought on the contrary to act as a stimulus in inciting us to the accomplishment of the object in view, rather than induce us to retrograde, which we certainly should, did we consent to follow the *dictates* of Mr. Burnham.

To be useful and deserving members of society, we must have education; and to have the education which a gardener requires now-a-days, we must have many books, which our present low wages entirely deprive us of. It therefore behoves us to adopt the most eligible means which we may be enabled to substitute for the privations under which we so unhappily labour. For this purpose, a mutual instruction society has been proposed, and I have no doubt but it would be attended with the most happy and beneficial results, were it once only established, and patronised by a few influential and *resident* individuals. The success of an enterprise of this description does not depend so much upon the pecuniary advantages it may pos-

ness, as it does upon the *integrity*, *assiduity*, and *well-directed motives* of those who undertake its *official* management. If, then, Mr. Burnham admits our last position, his *money argument* must fall to the ground.

Mr. Burnham, however, is not satisfied with tearing the society to pieces, but he must also have a *slap* at those for which it is more particularly intended ; and, among other things, tells us, that " young gardeners brought up in gentlemen's gardens know very little about growing good vegetables," and, as he " believes, less about cropping their ground." This, certainly, is a very pleasing discovery, which Mr. Burnham has had the *distinguished* honour of bringing before the public ; and " young gardeners " will surely feel greatly indebted to Mr. Burnham for his good opinion of their professional merits. We aspirants of the spade are also highly favoured by Mr. B.'s kindly pointing out to us the numerous emporiums of consummate horticultural wisdom which we *undoubtedly* were before entirely ignorant of ; and where many of the favoured of us, from situation, may go, these " long evenings," to slake our mental thirst by the infallible practices of a Bagley, a Dancer, &c., and where " every gentleman's gardener who is fortunate enough to visit, may contemplate with astonishment " the horticultural wonders which our *notable* London market gardeners can produce.

But, to be serious, Mr. Burnham deserves credit for the open and unreserved manner in which he has expressed himself, if not for his sound judgment in bringing forward such " irrelevant matter " to blight the dearly-cherished hopes of those who are interested in the success of the society : and as Mr. Burnham's objections, when put together, are but few, I will endeavour, briefly, to convince him of their entire futility, and that they have a directly reverse tendency to that which Mr. Burnham intended them to have.

Mr. Burnham tells us, in very " strong terms," of the eminently superior mode of kitchen cropping pursued by the London market gardeners, and entreats all who have the opportunity to visit these gardens, and learn from " practical observation " that which they could not learn " were they members of twenty gardeners' societies." Now, I fully agree with Mr. Burnham in all that he has said relative to the excellency of the practical operations of the London market gardeners ; as I have had many opportunities of seeing these gardens, and give their managers full credit for the superior vegetables which they annually produce. But I maintain that their success is more to be attributed to the practical knowledge they have acquired of their respective gardens, from a long course of years, than from any actual knowledge

they have of the inherent chemical capabilities of their soil; and, consequently, that their mode of manuring and cropping their ground may be altogether inapplicable to many gentlemen's gardens, where the soil and situation must necessarily vary much. Now the object of this society is, by means of books* and mutual instruction, to enable its members to make the science and practice of gardening bear on and be subservient to each other. For instance, if we find by practice any particular soil favourable to the growth of a particular sort of vegetable, we, by chemical analysis, ascertain what the constituent properties of that soil are (which will probably be found to be composed of *alkaline earths* and *common earths* in various proportions); then when we have ascertained this, we are in possession of a *quantum* of real, useful, and definite information. But until gardeners understand the science of gardening as well as the practice of it, they need never expect to be successful in every branch of their profession. And for young gardeners to go to see these market-gardens, *that they may merely see the astonishing productions thereof*, without learning anything of the nature of the soil and subsoil in which they grow, would be parallel to an engineer gazing at a steam-coach passing along the road, that he might understand its internal machinery.

Mr. Burnham acknowledges that "the life of a young gardener is a life of privation:" why, then, should he oppose a society which is so obviously calculated, and solely intended, to ameliorate his condition, by affording him a cheap and efficient means of acquiring a scientific knowledge of his profession?

This I believe to be the worthy object of Messrs. Walker and Fish's advocacy, as also that of "W. P. A.," and I sincerely trust that the day is not far distant when these intelligent and benevolent individuals will yet have the gratification and honour of accomplishing what they have proposed on behalf of their younger brethren, and that their laudable design will not be defeated by either prejudice or illiberality.

Yours, &c.

LUCILIUS.

Middlesex, May 14th, 1836.

NOTICES OF BOTANICAL PUBLICATIONS.

EDWARDS'S BOTANICAL REGISTER, continued by Professor Lindley.
The June number contains:—

1. *Habenaria procera*. This is a rare species of the genus, and has been long marked in the lists of *Orchideæ* by Afzelius and Persoon.

* I believe it is in the plan of the projected society, that there shall ultimately be a library formed by donations and by a *trifling* subscription from each member.

But little was known of it till imported and flowered by Messrs. Loddiges last year.

This plant is remarkable for its length of spur descending like a *rein* or *thong*; and hence its generic name. From its resemblance to the British butterfly orchis, it might with reason be referred to *Platanthera*; but Dr. L. has given a careful description, in which he shows the difference of structure, and by what it is readily distinguished from that genus.

It is a damp stove plant, but requires a seasonal management, that is, keeping it dry when at rest, and particularly warm and moist while growing.

2. *Cattleya labiata*. Crimson-lipped Cattleya. This is, without exception, one of the most showy of all the *Orchideæ*. This species is a native of Brazil, whence it was introduced near twenty years ago by Mr. W. Swainson. It has often before appeared in botanical periodicals, and Dr. L. fears he will hardly stand excused for intruding it again on the public; but he pleads as an excuse that such a beautiful plant cannot be too extensively known.

3. *Cratægus Crus Galli*; var. *ovalifolia*. Oval-leaved Cockspur Thorn. This is a hardy small tree, a native of North America. Two varieties are in our gardens, viz. the broad-leaved and the pyracantha-leaved. This is less known, and Dr. L. agrees with Mr. Loudon that it is only a variety of *C. Crus Galli*. It is sometimes called *C. Pennsylvanica*.

4. *Mormodes atropurpurea*. Dark-purple Mormodes. An orchideous plant from tropical America, first described by Dr. Lindley. The leaf-stem is gouty, bearing alternate leaves. The flower-stem proceeds from a swollen base, bearing a dense spike of deep-purple and lilac flowers, rather curious than beautiful. From the lugubrious aspect of the flowers its generic name is bestowed. It differs from *Catasetum* and *Myanthus* in the want of cirrhi upon the column, and from *Monaecanthus* in its lip being membranous and curved upwards, with the sides turned downwards, like the sides of a saddle, instead of being fleshy and helmet-shaped. A tender stove-plant, requiring the same treatment as *Catasetum*.

5. *Kennedyia macrophylla*. Large-leaved Kennedyia. A beautiful climbing plant, introduced from Swan River, in New Holland, by Sir James Stirling. It was raised in the garden of R. Mangles, Esq. at Sunning Hill. It is a beautiful ornament in the green-house, if the branches are trained closely together round and round one or several props, so that the spikes of pale purple flowers may be brought in contact.

6. *Tricophilia tortilis*. Twisted-petalled *Trichophilia*. Here we have again another extremely curious and rather beautiful flowering new genus of *Orchideæ*.

It was introduced from Mexico, in 1835, by George Barker, Esq. of Springfield, near Birmingham, by whom it was communicated to Dr. Lindley. This genus in many respects "approaches *Maxillaria*, but differs in the column not being reclinate upon the ovary and subtended by the partially united lateral sepals, in the regular expansion of both sepals and petals, and especially in the singular column, terminated by three little plum-like lobes which unite at their bases into a sort of hood or cap (hence the generic name) that covers over a remarkably compressed anther." The lip is pure white blotched with crimson, the latter tint also occupying the interior of the funnel formed by the rolling of the lip round the column. It may require similar treatment as *Maxillaria*.

7. *Lychnis Bungeana*. Bunge's *Lychnis*. A very beautiful species described and sent to England last year by Dr. Fischer of St. Petersburg. The flowers are large and of a bright brick red, the petals being elegantly gashed like many of the other *Silenaceæ* to which section of *Caryophylleæ* the plant belongs. It is not quite hardy, but easily kept and propagated in a light green-house.

8. *Dendrobium macrostachyum*. Long-spiked *Dendrobium*. There appears to be no end to the genera composing the natural order *Orchideæ*. This, which bears very long spikes of numerous pale-yellow flowers disposed in threes together, is a native of Ceylon. Some years ago a specimen was sent to Dr. Lindley between two sheets of brown paper, packed in a dry chest. A portion of the specimen showed signs of life: this was fastened to a damp shady wall in a stove; it gradually recovered its colour and began to grow, and from one of its offspring the present drawing has been taken.

9. *Manettia cordifolia*. Heart-leaved *Manettia*. A hot-house climber, running to the height of four or five feet, and clothed with a profusion of scarlet trumpet-shaped flowers in the month of June. It is easily increased by cuttings, and well worth cultivation. It belongs to the fourth class of Linnaeus, and to the natural order *Cinchonaceæ*.

SWEET'S BRITISH FLOWER-GARDEN, continued by Professor Don. The June number contains:—

1. *Kerria Japonica*. Japanese *Kerria*. The double variety of this plant has been long known in our gardens, having been introduced in 1804, and is now become an universal favourite, and alike the ornament of the palace and the cottage. The single variety was until lately

scarcely known, except through a solitary specimen preserved in the Linnæan Herbarium, and which had been communicated by Thunberg to his illustrious preceptor. It was introduced from China by Mr. Reeves, and flowered at the Botanic Garden, Chelsea, in April last. It was named by Decandolle in honour of Mr. W. Kerr, a collector sent to China from Kew.

2. *Nemophila aurita*. Ear-leaved. *Nemophila*. A very pretty annual, discovered in California by the late Mr. Douglas, and originally introduced to our gardens from seeds transmitted by him to the Horticultural Society.

It thrives in the open border, requiring no particular mode of treatment. The drawing was taken from plants in the nursery of Messrs. Allen and Rogers, Battersea.

3. *Rhododendron arboreum*; var. *roseum*. This splendid variety was raised at the late Earl of Liverpool's, Combe House, in 1819, by Mr. W. Smith, from Nepal seeds communicated by R. H. Jenkinson, Esq. One of the plants then raised blossomed for the first time in Mr. Smith's collection at Norbiton Common, near Kingston, Surrey, where the drawing was taken in the beginning of April. Dr. Wallich, writing of this family of plants, imagines that, the two light-coloured varieties occurring at a higher elevation than the crimson-flowered kind,—may prove to be more hardy. This, with all the other sorts of rhododendron, are now arranged in the tribe *Rhodoraceæ* of the natural order *Ericaceæ* of Don. In their native place they rise to the height of forest-trees.

4. *Ribes malvaceum*. Mallow-leaved Currant. An upright branched shrub, rising to the height of three feet or more, belonging to the natural order *Grossulaceæ*, a native of California, where it was found, and transmitted home to the Horticultural Society by the lamented Douglas. It is not so showy as the *R. sanguineum*, but is certainly worth cultivating in peat and loam soil among other shrubs.

PAXTON'S MAGAZINE OF BOTANY. The number for June contains :—

1. *Zygopetalon Mackaii*. Mr. Mackay's *Zygopetalon*. This plant was imported by Mr. Mackay, of the Dublin College Botanic Garden, from Brazil, about 1827, when it was soon after figured in the Botanical Magazine. The present beautifully-executed figure is from a plant which flowered with Mr. Bowe of Manchester last year. It may be classed among the most interesting of the order *Orchideæ*, and succeeds with the management usually bestowed on this now fashionable tribe of plants.

2. *Ipomœa rubro-cœrulea*. Reddish-blue *Ipomœa*. A pentandrious climbing herb belonging to the natural order *Convolvulaceæ*. The seeds of this splendid plant were collected by Mr. Samuel Richardson (an officer attached to the Anglo-Mexican Mining Association) in the province of Guanaxato in Mexico, by whom they were presented to J. D. Powles, Esq. of Stamford Hill.

The specimen figured was from the stove of the Birmingham Botanic Garden, where it flowered profusely. Mr. Paxton thinks that, though it has been hitherto treated as a stove-plant, it may succeed if planted in the open air, against a south wall, especially if the wall be flued.

3. *Camellia reticulata*. Netted-leaved, or Captain Rowe's *Camellia*. This is one of the finest of the genus: the flowers are only semidouble, but the extraordinary size of the blossoms, and the elegant spread of the bright rose-coloured petals, make it every way desirable in a collection. Mr. P. advises it to be grown in rather a stronger soil than the others, as it is of a more robust habit.

This number also contains a Plan of a new hot-water Boiler and Apparatus for heating a small Pit, invented by Mr. J. Rogers, junior, Streatham Common. It is said to be safe, economical, and perfectly efficient, at an expense of only 4*l.* 5*s.* if made of tin; but if made of copper, the cost would be no more than about six pounds.

Next follows a paper on the cultivation of the *Brugmansia suaveolens*, with hints on the practicability of hybridising this with the *B. sanguinea*. Also an extract from Rennie's "Alphabet of Gardening," on the Effects of Situation on the Growth of Trees and other Plants; and on "Plants suitable for grouping in Flower Gardens." Remarks on and culture of the genus *Tamarindus*. Remarks on the *Barringtonia speciosa*; on the Age of Plants; on the Origin of Weeping Trees. Hints on the Treatment necessary for a few valuable Green-house Plants. A list of new Plants figured in Periodicals, Business of Flower Garden, &c.

SMITH'S FLOEBISTS' MAGAZINE.

The June number contains—1. An accurately-drawn and delicately-coloured foliage and truss of flowers of *Taylor's Glory Auricula*. The directions attached for raising seedlings, &c. are good; but there appears some slight discrepancy in the description. 2. A plate of *Narcissi*, representing *N. bicolor* and *N. interjectus*, two very hardy species. 3. A plate containing three of the finest Pansies, namely, *Pomona superba*, *Count de Sellis*, and *Desdemona*, carefully coloured. The figures are accompanied as usual with judicious directions and some very pleasing sentimental observations.

This twelfth number completes the first volume of this beautifully-executed work ; to which is added, the Index to the Plates, a finely-engraved Title-page and coloured Vignette, together with a Dedication to the Princess Victoria, Preface, &c.

LONDON HORTICULTURAL SOCIETY.

THE second exhibition for the season took place on Saturday, and never was a court more crowded. We do not recollect on any previous occasion so great a number of visitors, notwithstanding the threatening aspect of the morning. They who braved the noon were repaid by the the tranquil serenity of the evening ; and the assembly lingered in the gardens much beyond the usual hour. The multitudes of flowering shrubs now in their beauty, the plants cultured and those of spontaneous growth, that decked the edges of the ponds and the grassy lawns, seemed to have an attraction equal to the more selected specimens beneath the exhibition awnings.

The prizes were awarded in the following order :—the first gold Banksian medal to Mr. Lane, gardener to J. H. Palmer, Esq. ; F. H. S., for a collection of *Alstræmerias*. The same gentleman obtained a silver Knightian medal for specimens of *Amaryllidæ*, and another for a collection of *ferns*, of many varieties of *frond*, and displaying beautifully beneath the interesting processes of inflorescence, to repudiate the title of their class. A rare Chinese plant obtained a fourth medal.

The second gold Banksian medal was awarded to Mr. W. Barnes, gardener to G. W. Norman, Esq., for a superb collection of greenhouse plants. A collection of *Alstræmerias*, second only to those of Mr. Lane, secured a large silver medal for Mr. Scott, gardener to C. Barclay, Esq. Mr. Green, gardener to Lady Antrobus, obtained one large silver medal for *Calceolarias* ; a second for specimens of *Cacti*.

A large silver medal was adjudged to Mr. Dennis, of Chelsea, for *Melo-cacti* ; one to Mr. Brown, gardener to Messrs. Credland and Clews, for Grapes ; a second for Cucumbers ; and a silver medal for Strawberries. Sigismund Ruiker, Esq., for a display of stove *Orchidæ*, obtained a large silver medal ; a silver Knightian for an Asiatic plant not named ; and a silver Banksian for a specimen of a greenhouse plant. To Mr. Rollison, of Tooting, was adjudged a large silver medal for an American *Orchis*. One to Mr. Gaines for *Pelargoniums* ; a silver Knightian for *Calceolarias* ; and another for Heartsease. The

Pine-apples of Mr. Floud, gardener to J. Guest, Esq., obtained a large silver medal, and his Melons a silver Knightian medal. Mr. Rivers, of Sawbridgeworth, for his China Roses, obtained a large silver medal; for his hardy *Azaleas* one Knightian; and for his garden Roses another. Mr. Fleming, gardener to C. Ranken, Esq., for his greenhouse plants was rewarded with a large silver medal; and Mr. Douglas, gardener to Earl de Grey, was honoured with a similar distinction for a plant from New Holland.

Other silver Knightian medals were adjudged to Mr. Cock, of Chiswick, for Balsams; Mr. Mills, gardener to N. M. Rothschild, Esq., at Gunnersbury Park, for Cockscombs; Mr. Pratt, gardener to — Harrison, Esq., for *Melo-cacti*; Mr. Foggo, gardener to the Marquis of Abercorn, for Figs; Mr. Judd, gardener to W. Gambier, Esq., of Sacombe Park, for Grapes; Messrs. Hill and Colley, Hammersmith, for Pelargoniums; Mr. J. Wilmot, Isleworth, for Pine-apples; Mr. Nieman, gardener to P. C. Labouchere, Esq., for Peaches and Nectarines; Mr. Glenny, F.H.S., for China Roses; Mr. Redding, gardener to Mrs. Marryatt, for double *Eschscholtzia Californica*, and for the usual rich variety of greenhouse plants, so tastefully arranged as to mark from whence they came; Mr. Russell, of Battersea, for a New Holland plant; and Mr. Hoskins, gardener to J. V. Maubert, Esq., F.H.S., for Cape plants.

Silver Banksian medals were also granted to Mr. H. Groom, of Walworth, for an unrivalled display of *Calceolarias*; to Mr. Mountjoy, of Ealing, for specimens of Heartsease; and to Mr. Barnes (G. Norman, Esq.) for a plant of the *Phlox Drummondii*, a valuable and pleasing addition to our list of flowers.

CALENDARIAL MEMORANDA FOR JULY.

KITCHEN GARDEN.—The getting in a good stock of winter vegetables is the principal business of the month; therefore sufficient breadths of cabbage, savoys, borecole, and all other sorts of hardy greens, should be planted out for good. A full crop of celery should now be put out in trenches or beds;—the previously pricked-out seedlings will now be stocky, and in fine order to go into trenches. Now is a good time to plant the principal crops of broccoli for winter and spring service. Michaelmas cauliflowers, if not already done, should now be put in their final station. Endive should be sown twice in the month, and seedlings from former sowings transplanted consecutively. Lettuce

and all small salad plants should be sown or transplanted, as may be requisite. Black and white Spanish radish may now be sown; also a large bed of carrots, to draw in November or throughout the winter, if protected from frost. In the last week, sow a full crop of onions to stand the winter; at the same time sow a large piece of winter spinach. A large bed of Battersea or sugar-loaf cabbage should be sown about the middle of the month, to be planted out as coleworts. Turnips may be sown twice, in order to secure a regular supply.

The growing crops requiring attention at this time are, those needing the support of sticks, as peas and runner French beans; earthing-up celery and cardoons; pruning off side-shoots of artichokes, and breaking down the stems of those already cut for use; watering, wherever necessary; and gathering whatever is ready for storing—as shallots, garlic, onions, and all sorts of herbs for drying. Clean and prepare vacant ground for the reception of winter and spring crops, &c. &c.

FRUIT GARDEN.—The fruit-trees on walls, and indeed all trained trees, are ever requiring the assistance of the pruner. To free the trees from supernumerary shoots, and keep the reserved ones in regular order, is highly necessary at this time. Insects will be ravaging, if not banished, and mildew will destroy the points of the best shoots of peach and nectarine trees, if not kept off by applications of soap-suds or sulphur. Vines at this time also require constant regulation;—in short, the beauty of the trees in this, and their fruitfulness in the next year, mainly depends on what is done for them in the summer months.

FLOWER GARDEN.—Whatever was omitted to be done in June, should now be performed without delay. Take up bulbs and tubers when the leaves are withered; sow and transplant annuals to bloom late; propagate pinks, rockets, carnations, &c.; divide auriculas, and re-pot them, keeping them shaded; also all other plants in pots—as Chinese primroses, &c.; stake dahlias, and propagate pansies; sow seeds of biennials; prop Chinese chrysanthemums; regulate the patches of previously sown annuals; shift hothouse or greenhouse annuals, &c. Sowing, transplanting, shifting into larger pots, propagating by layers and cuttings—propping, shading, and watering when necessary—form the constant employment of the flower-gardener during this month.

REMARKS ON THE WEATHER.

THE current month has been and continues rather changeable: the former part dry, and often very warm, so that a want of moisture began to be felt. This parching heat was followed by thunder-storms and heavy showers of rain. Vegetation, which had been kept in check by the backward spring and succeeding drought, was suddenly excited into exuberant growth; and the kitchen-garden, which scarcely afforded, a month back, a dish of peas, a cauliflower, or even a decent salad, is now overflowing with everything.

Such circumstances are often experienced in this variable climate, and there is no guarding against them. Their effects as affecting the business of gardening, are, bringing in too many crops at once; and which were intended and expected to have come in *seriatim*, during part of April, May, and June, have, for the most part, come in the present month. Wagon-loads of vegetables, which were invaluable some time ago, are now a drug in the markets, and a nuisance in every street. However, as they will be quickly cleared off, the ground will be the sooner vacant to receive other crops.

As far as our observation extends, there will be only what is called a middling, by no means a great crop of fruit this year. In later districts of the kingdom, the crops may be more abundant than in those, which, from more southerly situation, or warmer soil, are more liable to suffer from the night frosts, which prevailed during the flowering season. But we have no report that this is really the case.

The showery weather with which we are now visited is very favourable for getting in the winter crops of celery, broccoli, &c. as well as for cleansing the foliage of trees and shrubs, and assisting every thing now advancing to maturity.

June 24th, 1836.

PAXTON'S
HORTICULTURAL REGISTER,
AUGUST, 1836.

HORTICULTURE.

ON THE COILING OF VINES.

Welbeck Gardens, 2nd July, 1836.

SIR,—I am certainly much astonished at the scepticism of many otherwise eminent practical gardeners, respecting the opinions they entertain of the merits of the coiling system for the purpose of propagating the grape vine.

I beg to state to Φιλοσοφος, that he appears to be but little acquainted with the physiology of the vine, when he would maintain that I am in error when I cut off *all* buds upon that part of my coil intended to be beneath the soil. If he retains those buds, which it seems he considers rather important to do so than otherwise, he will find that he will do but little good with his coil either the first or second season.

I beg to inform him that “buds are” (*certainly not*) “the origin of roots.” A vine-cutting coiled into a pot, after being denuded of every bud or excrescence likely to throw up a sucker, will produce as fine vigorous roots the *first* season, as if every bud had been present. I have proved it by variously-repeated experiments on the vine, and likewise upon *blind* tubers of the dahlia.

I should be most happy for Φιλοσοφος to honour me with a call, and I flatter myself that he will then judge differently of the importance of the coiling system of the grape vine.

Rootless branches, coiled into pots the 19th of last February, have at this time *vigorous* bunches of grapes upon them; and although of

the choicest sorts, they will be as perfectly matured as any grapes can possibly be by any other established treatment. I have a *fine* variety of White Muscadine, coiled on the above day, and it will perfect ten fine bunches *vigorously* and healthy. I had a cutting of some length from Clumber on the 15th of March last; I coiled six feet into the pot; and it will mature seven good and perfect bunches.

The same impulse which prompted me at *first* to give to the public the earliest notice of so important a discovery, would at this moment induce me to do the same, as I still consider it to be an important feature in the art of grape culture, by creating an emulation which was in deed and in truth required; by simplifying the art, and by showing that grapes can be grown profitably and *successfully* by the pot-culture; and if you will refer to the Register, you will there find my motive for ever treating of the subject. I was sorry that any man, or set of men, should take upon themselves to publicly condemn a system of cultivating the grape which I had long practised successfully, and much admired for its great interest, simplicity, and importance. To induce the practice of pot-culture, I then stated that "it may not be known that good grapes can be produced from a rootless shoot the first season, by coiling a certain length of it into a pot, and plunging it into a bottom-heat till the fruit are set," I cannot call to remembrance my exact expression, and the volume is not by me. The only important fact which I have discovered since I first noticed it, is the absolute necessity of retaining the *moistened* moss round the stems (above the pot) till the grapes are set; when they are perfectly *safe*, the moss can then be displaced, with all the roots connected with it. At the same time remove the pots from the bottom-heat to any convenient flue or stage, so as to be near the light and air.

I have been too long an enthusiastic cultivator of the grape, to have announced any system to the public which I was not well convinced would stand the test of ages; and I would willingly hope that the cause of failures in the coiling system, by others, proceeds from the same as that which prevented Mr. Gray from being successful in the pot-culture, and induced him to condemn the practice so unjustly and injuriously; namely, from a rather too lukewarm interest in the novel practice, rather than a prejudice against the system. I believe there is no set of men, of the same calling, so friendly amongst each other as gardeners; and through my whole life I have taken great pleasure in their society, and no small degree of interest in their welfare; and if at any time I have been of the smallest service to any of them, it has greatly contributed to the enjoyment of my life.

Φιλοσοφος states that "he knows grapes may be developed, grown,

and completely matured by a coiled shoot of a vine—a regular-bearing shoot—cut from a wall, destitute of roots, and passed round a No. 12 pot ;” and he repeats it, that “he *knows from his own individual experience*, that perfectly-ripened fruit *may* be produced by such a branch within five or six months after it has been introduced into a stove.”

Now I beg to state, that in all my *enthusiastic* practice of forty years, and extensive correspondence and friendly connexion with many of the most eminent horticulturists of my time, I never once heard the *coiling* of a shoot hinted at by any one, or in any *shape* ; and I think, had it ever occurred to Mr. Knight, (near to whose residence, at Downton Castle, I had the happiness of residing for nearly twenty-seven years of the prime of my life,) I must have heard him remark it. I believe the circumstance had never struck him, or, with his free and familiar manner amongst gardeners, I am sure that he would have noticed it ; and I should not have failed of introducing it many years earlier into practice, under that most amiable and excellent gentleman's name, instead of my own. I should have felt a great pride in doing so, as it might then have been thought better of amongst some—I would trust, by every one who knew him personally.

“Take him for all and all, we ne'er shall know his like again.”

Had the practice of coiling shoots into a pot been *once* but *successfully* practised, as it certainly has been done here, it would have disclosed so important an event in the culture of grapes, and created such a degree of interest amongst horticulturalists generally, that, I believe, had the discoverer been narrow-minded enough (as many *used* to be) to desire to conceal it, as an art and *mystery*, it would very soon have been publicly known amongst gardeners, if not generally practised till better known.

My practice *alone* has been sufficient to prove its importance, and to be a most interesting feature in the culture of that important fruit.

I beg to remind my friend Φιλοσοφος, that *buds* retained upon any part of the *under-ground* coil of a vine intended to have a portion retained above, either to produce fruit or vigorous wood, are *suckers* to all intents and purposes, and of course are most noxious to the intended prosperity of the vine:—every bud or excrescence left upon those parts to be laid beneath the soil, turns out to be nothing but a thief and a robber, and should never be suffered to exist, if success is intended. Those who would argue against it, will, like Mr. Fish, be sure of a failure if they attempt it. Φιλοσοφος may rest assured that a bud left

underneath the soil will add nothing to the commonwealth, but will monopolise all for its own individual use, and will never, whilst we are in want of support, give one particle to the well-being of the intended object. I have long ago tried it. "*Buds will*" (not) "*turn to roots,*" although they may increase the vigour of those contiguous to them;—they serve to plunder the main object, instead of adding anything towards its support. It is true, the bulk of a tree is most increased by the greatest proportional quantity of branches and quantity of foliage exposed to the light and solar influence; but in studying the economy of the sap in the coiled vine, I have another object in view. I should wish that Φιλοσοφος would try his own suggestion, and retain the buried buds, and he will be much better able to judge whether he or I be in error.

He states that "a vine of old or last year's wood, coiled from three to four feet into a sixteen or twelve pot, one eye only being permitted to approach to within half an inch of the surface—the whole, however, being covered with light vegetable earth, made open by bruised bones, and being well drained at bottom—will push vigorously, and may produce shoots twelve feet long, and nearly half an inch in diameter in one season: such a shoot, well trained, will support from six to twenty clusters (according to its kind and the shortness of its joints) in the second season." I fear that, unless Φιλοσοφος adopts my practice a little farther than what he states above, he will come far short, the second season, of producing so many clusters of prime, and of the choicest kinds of grapes.

I have already stated in the Register my method of successfully performing that practice, and, therefore, I am unwilling to trouble you with any superfluous remarks upon the subject. I hope the world is more enlightened and liberal-minded than when Dr. Harvey *dared* to tell the world that the blood circulated. What abuse, what contumely, and even insults, did he not receive from the faculty of his time! What can we think at this period of those *learned heads*?

I beg it to be clearly understood, that my first impulse to enter upon this subject was in defence of the pot-culture of the vine; and any discovery to promote expeditious culture is undeniably of great service. By this method, the fruit may be supplied for the table, in the greatest perfection, the whole year round, when the proper means and skill are employed. Even when grown in *pots of moss*, with common clear water, excellent fruit are produced. Pot-culture of the grape vine will soon become one of the greatest pleasures the amateur of gardening can enjoy. It is the only means of making him *early* and well acquainted with the habits of the vine, and of all its choice varieties.

To recommend this mode of cultivation, and to show how expeditiously it might be done, has been the grand aim of all I have written on the subject. This being the case, it is surprising that any lover of gardening should so far forget himself as to condemn a system which he has never seen practised properly, nor does not, it is evident, understand.

I am, Sir, your obedient servant,

JOHN MEARNS.

[We willingly give place to the above letter from Mr. Mearns, because, as his ideas respecting his success in coiling vines, published in "The Gardener's Magazine" and "Horticultural Register," have been attacked *through us*, and which (though a pretty rebuke to ourselves) we gave insertion to from a principle of editorial duty compelling us to *hear both sides*; yet we must disclaim taking any decided part in the controversy, any farther than allowing Mr. Mearns to remonstrate and explain. When assertions are made on one hand, and denials on the other, it is impossible for us to decide which is right, unless we visited Welbeck, (which Mr. Mearns most urgently begs us to do,) which we have only to regret is not now in our power, although we consider the invitation a very strong proof of what is advanced in the above communication, and for which he has our best thanks. We have only to add, that our friend Mr. Mearns is mistaken in his suspicion as to the correspondent with a *Greek cognomen*.—EDITOR.]

ON THE CULTURE OF THE PINE-APPLE.

SIR,—Your kind acceptance of my late paper on the Pine-apple induces me to fulfil my intention of sending a second in continuation, wherein I propose to describe a method of growing this exotic which I have seen practised; and though it be not new—as it was pursued by Baldwin, Peter Marsland, Esq., and by several others—it is still very little adopted. Those who grow the pine-apple on a small scale, or who wish to do so, must, I think, find the method very convenient, as only one pit, heated either by dung or fire, will be required.

I must premise by remarking, that the plants so treated were principally of the old Jamaica variety, which, in my opinion, surpasses all others cultivated. The St. Vincent, or Green Olive, is also a most valuable fruit; yet, although so excellent, we seldom meet with either; thirty plants of the Queen, or its near varieties, being grown in most gardens, to one of the two sorts mentioned. The great objection to

them is their tardiness in fruiting ; but this will be no obstacle to the plan now to be described.

The fruit being cut in autumn, one sucker, and in some instances *two*, were left on each stool ; all the old leaves were removed at the same time : but this ought to be done with prudence, for the suckers are sometimes weak ; and in that case, the sudden removal of the parent leaves will entirely check growth. This appears odd, and by many will perhaps be doubted ; but it is the fact, that if the sucker *be weak*, the entire removal of the old leaves throws, I may say, such an abundance of sap into it, as to gorge and fairly torpify it : it would, therefore, be prudent to leave on three or four leaves to most of the plants ; they can do no harm, and in some cases may do much good. The old stools may be *earthed-up* or not, as agreeable : those plants to which I allude were not, but remained untouched in the pit till the middle of February, when they were taken out, the suckers broken from the stools, planted in pots according to their sizes, and replunged in a good bottom-heat—about ninety degrees—with a fire-heat of seventy degrees. In this situation they soon began to grow, and in the end of May required shifting into pots large enough for them to fruit in.

Soon after this shift, the best-grown plants showed fruit, and the others threw up in succession. Ripe fruit was cut the following October ; the largest weighed three pounds nine ounces avoirdupois ; it was finely swollen, as indeed were all—none, if I rightly remember, being under two pounds in weight.

I have thus described as plainly and correctly as possible the method I saw practised. The plan has at least simplicity to recommend it, to say nothing of the quick return to the grower, who has to wait but twelve months for ripe fruit, and even less ; whereas, in the common method, it takes from twenty months to three years before the plants ripen their produce.

It has now become the general opinion, that the quicker the plants are grown, the better the fruit will be, particularly in size. I have, therefore, presented a plan to the notice of your readers, which, for expedition, has not been surpassed by any. I should observe, that *bone-dust* added to the soil, if of a sandy nature, appears exceedingly congenial to the pine-apple plant.

July 9th.

A. L. A. T.

The paper on the "Shrivelling of Grapes" shall be sent for next month's number.

LANDSCAPE GARDENING.

LETTER FOURTEEN.

DEAR SIR,—I ended my last epistle by stating the opinion of many eminent men and writers on fine taste, as to what should be the course of study the landscape gardener should pursue, in order to store his mind with pure and correct ideas of natural scenery, and so to be able to apply them in every case where he might be employed.

When we survey the various features which diversify and adorn the surface of the earth, some, we find, are much more interesting than others. In one place we have extensive prospect; in another, an assemblage of objects which astonish from their immensity, their towering height, or their profound depth;—such scenes are said to be *sublime*. Other scenes, in which appear a gently-winding river or placid lake, margined with verdant turf, diversified with scattered masses of formally-tufted, aspiring, or pendent-branched trees and evergreen shrubs, with a surface flowing in gentle undulations, and where general smoothness, softness, and freshness prevail—such scenery, of whatever extent it may be, is said to be *beautiful*. If this kind of scenery, however, had a rapid river dashing along in a rugged and tortuous channel; if dark granite cliffs started up from an uneven and much-broken surface in various places, and of different altitudes; if many grotesque and thunder-scathed trees were here and there scattered about—some shrouded in ivy, or surrounded by black-thorns, brambles, burdocks, and ferns; if a ruined mill, with its broken water-wheel, appeared on the river's brink, and on a neighbouring crag the dilapidated turrets and battlements of an ancient castle seen high above a base of dark-tinted pines: and, moreover, were a camp of gipsies, with their half-naked children, their shaggy dogs and asses seen on the foreground of such a scene—the whole would be called *picturesque*. When any portion of the earth's surface has been appropriated to the special use of man, and smoothed and decorated by ranks of trees, clumps of shrubs, and knots of flowers, showing the predominance of art and studied design—such scenery has been designated by a well-known author *gardenesque*.

These are the different characters of scenery. Sometimes they are met with distinctly marked, but much more frequently mixed; so that the sublime may become merged into the picturesque, and the latter may be mellowed into the beautiful.

To create any scene deserving the character of sublimity is entirely

out of the power of the landscape gardener; and but few painters succeed in depicting such scenes, unless assisted by the narrative of the historian, the visions of the poet, or the unnatural *indistinctness* and absurd *obscurities* of their art.

The creation of beautiful scenery belongs particularly to the province of the landscape gardener; and when he has a fair field on which to display it, and is thoroughly cognisant of its principles, generally acquits himself with credit. His dispositions are usually pleasing; but, unluckily for him, they do not attract the fastidious eye of extremely *fine taste*. Neither are beautiful scenes admired by the landscape painter; their bland smoothness and regularly-flowing lines offend him; there is too much sameness of tint, not sufficient contrast, nor flickering intricacy, to give freedom and licence to his pencil; and therefore it is that purely beautiful scenes are seldom painted.

It is the next description of scenery, namely, the picturesque, which the connoisseur delights to contemplate, and the painter to pourtray. Such scenery has received its very designation from the circumstance of its being so often chosen for the canvas; and it becomes a question whether the *ease* of the artist and *facility* of execution on the one hand, or any *real gratification* to either our mental or visual faculties on the other, have formed the standard by which all painted as well as real landscapes are judged. This surmise requires, perhaps, a little explanation. I presume you will agree with me that all regular figures are more difficult to draw—at least they require much more care in tracing the outline—than those that are irregular. Any fault in the latter—a tree, for instance, however differing from the original—cannot be discovered; whereas the most trifling defect in the representation of an obelisk, column, or other regular figure, is, on the most transient glance, detectable.

To suit the notions of the artist, there are also what are called *painters' trees*—that is, such as are but thinly clothed with leaves, and these growing in tufts, through which all the ramifications of the branches may be seen. A tree of a regularly rotund or pyramidal shape, or if it bears a thick mass of foliage, is an abomination to a painter; and therefore nothing but the most irregular dispositions and forms, the deepest shadows, and warmest varied colours (for uniformity of colour is also disliked) are considered fit for the pencil.

These being the ideas of painters, and all the most famous pictures of the old masters being painted in this style, it is not at all to be wondered at that modern critics can relish no real scenery, unless it bears some resemblance to the standard on which they have grounded their principles of taste. Of course they advise all landscape gardeners to

improve their ideas upon the same models, and that they should imitate as far as possible the compositions of the ancient masters.

But we have next to inquire what it really is in the paintings of Claude Lorraine, Poussin, and others, which inclines us to look upon their productions with so much pleasure. Many of them, no doubt, are only ideal compositions; and consequently there is no such thing as comparing them with existing scenes, in order to judge of their faithfulness. Still, even supposing them to be ideal, we cannot withhold our admiration of the general harmony of their pictures—the well-balanced light and shade—the imperceptible touches by which the colours are blended with each other—the happy combinations of trees, shrubs, and herbs on the foreground—and the numerous interesting objects in the offscap;—these arrest the attention of the most incurious, and also show the rich and fertile imagination of the artist. Much of our approbation so readily bestowed on those matchless works may be, however, only complimentary to the masterly manner in which the colours are laid on, and the way in which the objects and figures are disposed. We may admire the forms of the trees, without being able to say what trees they are; we may extol the mild or solemn light thrown over the whole picture, without being able to guess at what hour of the day or night it was studied or painted. We, besides, must often make allowance for the licence of a poetical painter, and for the exuberance of his fancy, especially in his choosing just such a *placid* or *stormy sky* as will best suit the character of his scene. He may introduce dead or shattered trees, or other wrecks of nature—ruins of buildings, or other wrecks of art; but all this, so allowable and admirable in paintings, cannot be introduced with propriety into the works of the gardener; and thus far the first should not be held up as a model to be closely followed by the latter.

It is very true, we have heard of *dead trees being planted*, and *ruins built* at a vast expense, by talented and rational men! But who would call such freaks pure taste? If the ruins of an old mansion happen to stand upon the ground required to be dressed around a new house, they may remain with propriety, because some local history is connected with such vestigia, and ideas associated of an interesting kind: but to build ruins, or, what is said to be a better way, build a handsome structure having somewhat of an *architecturesque* character, and then immediately let it be partly demolished and defaced by the hammers of the builders! and when this is artificially weather-stained, and covered with ivy, wall-flowers, verbascums, &c., it must then be fancied a striking feature of some favourite scene, is quite ludicrous.

In following so closely the style of the ancient painters, and introducing several of the objects which frequently appear in their works, many very silly things have been executed. Irregularity has been *irregularised*; smooth sloping banks of turf, instead of being varied by planting shrubs, have been cut into *deep scars*, in order to expose the different strata of the naked soil; trees have been advised to be planted in the middle of a leading walk, for the purpose of making the walk trend *elegantly* on both sides! The advisers or performers of such notable exploits seem to forget that, however pleasing such circumstances may be as the result of accident, they become ridiculous when imitated by art.

But, to return from this long digression, how far are those arbiters of fine taste in the right, when they advise the ground-improver to copy from the accidental associations of herbs, shrubs, and trees, so constantly seen in forests, or such woodlands as we were then traversing? It is perfectly true that we saw in those woods the most beautiful play of turf, studded with many various and dissimilar groups of trees, all very naturally associated; and we admired them not only because every group appeared to be connected, and placed with special reference to others around, but also because the whole presented an interesting display of light and shade; some trees being boldly prominent, with deep and shady recesses between, and all being the effects of mere accident, enhanced the value of those wild, though pleasing, associations.

That a wood of great extent, dismembered as it were by grassy glades, and based in underwood, is much more interesting than an open grove of stately trees standing on naked turf, is a truth allowed by every one. This seems to have been the opinion of the old painters; who very seldom represented single trees, or trees unaccompanied with shrubs or other undergrowth; and it justifies the opinion of those who advise the improvers of park-scenery to repair to forests to take lessons. But can the same style of disposing ornamental trees, shrubs, and herbs, be applicable in higher-dressed or pleasure grounds? The best judges who have written on the subject answer, "Yes;" and it is an idea which has been very generally acted upon, as most of the pleasure-grounds in Britain are embellished by mixed groups of trees, shrubs, and herbs: even flower-gardens have been laid out in a similar style; composed of an aggregation of clumps and groups, of various forms and size, upon a base of smooth turf.

This is called imitating Nature in her most pleasing forms; but these virgin forms of nature are pleasing chiefly because they are unaccompanied by every mark of art. And it is objected to our present style of flower-gardens, that if nature be impaired by any interference of

art, so no dispositions of art, it is said, should be exhibited as imitations of nature.

This impression, whether right or wrong, begins to take effect, as several flower-gardens on rather a large scale have been lately laid out among us in the old Dutch or geometric style—a style of all others the most rigidly artificial. It is probable, however, that, except for flower-plots on a few square yards of surface, it will never be generally fashionable.

There is yet another idea broached respecting the arrangement of plants in flower or other pleasure-gardens: it appears to be founded on the principle that, as all gardens are works of art, so every thing in and about them should partake of that character;—plants should all be grouped according to their kinds and general characters; trees with trees, shrubs with shrubs, and herbaceous plants by themselves. In nature they are found intermixed, and for that very reason they should be, when cultivated, classed apart, and ranked each kind by themselves.

According to this notion, a public nursery is the true type of a well-arranged pleasure-garden; and though it may be considered so by a *rigid lover* of order, the eye, which, in viewing the vegetable creation, is delighted with its endless variety, will be disappointed in seeing that variety composed of *harshly-marked* and distinct grades, rather than in that *harmonious amalgamation* in which wild vegetation usually appears. Neither for the *continuous beauty* of a flower-garden is this grouping of genera expedient. Many of the herbs are seasonal, and visible but for a short time; consequently blanks would be ever occurring, which would either remain unsightly, or cause considerable labour to refurnish. There is a happy medium in all things; and the pleasure arising from a well-designed and well-kept garden flows directly from our feelings at the moment, rather than from any abstract ideas we may entertain as to whether the scene before us be exactly agreeable to, or consistent with, the rigid rules of pure taste or not. No one would object to the violet or snowdrop peeping from below the rhododendron, nor the hollyhock shooting up from among the laurels; but if we had seen either rhododendrons or hollyhocks in the wild wood in which we were riding, they would have been condemned as unsociable intruders.

In executing *gardenesque* scenery, the *grouping and variety of forest combinations* may be imitated with propriety, but it must be with *very different kinds* of plants: no rustic tree or shrub looks well if associated with cultivated exotics in dressed ground; nor do the homely forms of orchard fruit-trees assimilate with ornamental plants.

I am, Sir,

A. B.

(To be continued.)

MISCELLANEOUS INTELLIGENCE.

REMINISCENCES OF A VOYAGE TO AND FROM CHINA (*continued from page 262*).—At break of day on the 19th of June, the Island of St. Helena was visible a-head, at the distance of about six miles. In the early dawn, it appeared like a vast black cloud floating on the surface of the ocean. Finding the prediction of the previous evening so correct, we could not suppress admiration at the accuracy with which the fleet had been navigated to this lonely speck of the earth, nearly in the middle of the South Atlantic Sea, and several hundred miles from the nearest continent of Africa.

Making sail, we neared the island rapidly, our course lying close round the eastern side, in order to reach the roadstead, which is before the only landing-place on the north-west angle of the rock. The nearer we approached this remarkable place, the more were we astonished at its vast altitude and rugged outline. While yet two or three miles from the nearest point of its base, the eye must be considerably elevated to view its topmost peak, from whence we could discern the signal-guns discharged, but were too far off to hear the report. A signal announcing the approach of a numerous fleet produces great commotion on this little world of granite. In time of war, all fly to arms; in time of peace, all hurry to their toilets, and proceed to the esplanade to receive their friends or letters from India.

The anchorage ground requires to be gained by a press of sail, in order to give the ship head-way to reach high enough on the shelving ground where the anchor is "let go," and then brought "head to wind;" for if the ground be missed, a voyage of a month, perhaps, would be required to regain the same spot. In approaching the anchorage, and close under the beetling crags, great caution is required in passing the deep and narrow clefts or ravines, as the sudden gusts of wind through these openings endanger the topmasts if the halliards are belayed.

All the fleet, however, got safe to anchor, and immediately our intercourse with the shore began. Despatches for the *Triton* were received; and soon after they were opened, we were summoned into the captain's apartments to speak with the purser (our employer's brother-in-law). We found him in tears, and he could only articulate, "*Main, our good friend is dead!*" Little more was said at that interview, but enough to send us away full of sad rumination to our own berth.

Next day it was determined, concerning the plants, that all which had any chance of reaching England alive should be kept in their places, and treated as before; and any of the most valuable, that were

in a precarious state, should be sent on shore, and kept in the garden of some friend who understood their management, until they were recruited, and an opportunity offered to forward them to England.

Accordingly the Azaleas, white and red flowering, a semi-double red Camellia, one or two Pæonias, &c., were landed, of which a list was kept by the gentleman above alluded to. It may be as well to mention here, that we never could learn what became of those plants, or whether they were ever brought to Europe.

Of our whole collection, not one-half remained alive on our arrival here. This failure, conjoined with the sad news we had just heard from England, gave us no small uneasiness; but what added to the poignancy of those heartburnings was, what we witnessed of the state of the other plants brought thus far in other ships of the fleet. These, for the most part selected and packed by ourselves, and in the same manner as we had prepared our own, were now, however, in a far better condition. Two or three boxes packed for Captain Henry Wilson, of the *Warley*, were in excellent order; many of them had scarcely lost a leaf. They were placed on the poop, abaft the skylight, exposed to all weathers, and seldom looked at or watered. Those packed for Captain Simpson, which stood on the capstan, (and of course under the awning of the quarter-deck in bright weather,) were also in good order, and but little damaged. Captain Smith, of the *Minerva*, employed us to select a few Pæonias for Sir Joseph Banks, which he kept in the stern balcony; they were also, on their arrival at St. Helena, in a fair way of reaching England in safety.

Our reception on shore was here, like what we had experienced at many other places in India, of the most flattering description. Mr. Porteus, the Governor's gardener, invited us to his home, near the Governor's country house, on the Table-land of the rock, near its centre, and on the very spot, we believe, which was afterwards chosen for the domicile of the Emperor Napoleon. To the Governor's house was a garden partly walled, on the plan of an English garden, in which culinary vegetables and European fruits were attempted to be grown; and that the semblance might be more correct, peach and nectarine trees were trained to the rugged wall—a most unnecessary expedient in so warm a climate. The orchard fruit-trees were all stunted and unthrifty, the apples being literally eaten up by the American blight (*Eriosoma mali*), which is exceedingly plentiful on the island. There is, at the upper end of the town, a spot of four or five acres laid out and planted as a pleasure-ground, called the *Company's Garden*. This contained a choice collection of tropical plants, and was used as a public mall by the inhabitants.

We were also fortunate in being invited to the country house of one of the principal merchants of the place, who had obtained a grant of land about half a mile beyond the Governor's house, which he was beautifying by loosening the rocky surface, and planting it with trees and shrubs, for the sake of having shady walks, so necessary and refreshing to the eye, on the summit of an almost naked rock. A conical hill, within the boundary, was already nearly clothed to the top with thriving trees and shrubs. At this place we resided for a week or ten days, giving our advice about the amelioration of the rugged soil, and obtaining depth for the reception of the trees, as well as pointing out the best way of disposing them.

James Town (the only town on the island) is situate at the mouth of a deep valley or ravine, open towards the north-west. It consists of one principal street of good respectable houses. The Governor's house, offices, guard-house, barrack, and extensive store-houses for the use of the whole population, are built across the lower end of the street; and on the outside of these is the parade, or esplanade, the sea-front of which is bristled with heavy guns, forming a battery extending across the mouth of the valley. There are also flanking batteries on the heights to the left, and a strong one on Ladder Hill to the right, mounted with heavy artillery on carriages of an unusual construction, allowing the muzzles to be so depressed as to fire through any ship's deck that comes upon soundings.

The other public buildings are, a church, and not far from it a small theatre; there is also a barrack and hospital, and a black town* in the interior. The whole government is military; and, as all depend on the public stores, so all are subjected to garrison duty when required. All except the soldiery follow their own occupations however, whether as merchants or artificers; but they are every one liable to be called on military duty at the command of the Governor.

Mr. Porteus, though the Governor's gardener, also held some military rank, and a most intelligent man he was. A principal topic of our conversation was the fate of the plants we had brought from China; and he gave it as his opinion that they had been "killed with care," because he had learned from experience that plants can hardly be kept *too dry* while on the voyage; and therefore all our anxiety in keeping them duly watered and sprinkled, as we would *have done* in a British conservatory, was labour lost. Mr. Porteus added that, in such cases, the parching effects of a vertical sun are never so fatal to lig-

* A group of low huts, where servants of colour, labourers, &c., reside.

peous plants, as its exciting and exhausting influence when united with humidity.

This information came too late for our then purpose ; the error was already committed ; for though there was still a two-months' voyage to encounter, there was no hope that a different proceeding towards our invalids would have been productive of much good. Our grand object was to prevent the plants getting worse than they then were, and this engrossed our subsequent care.

We left St. Helena on the 1st of July, with some feelings of regret, and with the most sincere sense of gratitude for the favours received from every one we chanced to meet. We envied our friend Mr. Porteus's situation—the high respect in which he was held by every officer on the island. Professionally, he appeared settled for life ; as a naturalist, he was fixed on a healthy spot, whence he could look towards both poles of the earth, and with every nation and distant corner of it had occasional intercourse. He had married a young and beautiful lady, a native of the place, whose innocent and *amiable ignorance* of the ways of the great world was truly interesting ; not so much so, indeed, as one of her own sex, (also a native of the island,) who had some years before told the captain of an Indiaman that his arrival in the Thames *must make London very gay* ! We have never had the happiness of hearing of our friend Mr. Porteus since we parted at the landing-place of the island.

The fleet was increased at our departure from St. Helena by the *Sampson* sixty-four, and the *Assistance* fifty, gun ships, besides several South Sea whalers. The voyage homeward, recrossing the Line, &c., was performed without any untoward accident. The plants continued nearly in the same state in which they had left St. Helena ; they were too much exhausted to be in any sensible degree affected by the torrid heat, nor did they present any signs of amendment when we reached the north temperate latitudes.

During this part of the voyage our mind was chiefly occupied with our own personal prospects, and what might be our fate on reaching England. Our fine ideal prospect of again returning to China was totally abandoned. The patron who alone could have imposed and made such a re-adventure agreeable to us, was no more ; and we had only to look forward to the "chapter of accidents" for future employment and bread.

When the fleet arrived off the Western Isles, the Spanish and Portuguese frigates fired their salutes and left us, we standing on for the chops of the English Channel, which we made on the 5th of September, 1794.

At sunset on the 4th, the greater part of the fleet were in sight, proceeding up the channel with a fine top-gallant-sail breeze, with thick cloudy weather and light drizzling rain. At the second hour of the middle watch (two o'clock in the morning), the officer and men who had the "look-out" on the fore-castle cried, "A sail on the lar-board bow;" and in an instant afterward the same voice cried, "A sail on the starboard bow;" and in the next instant a dreadful shock was felt. All was consternation and dismay. Two-thirds of the crew and officers were asleep—all was darkness and uncertainty. The thundering noise of the best bower cable running out—the noise of the officers of both ships giving orders—the calls of our own officers to sound the well, and fire signals of distress—the rubbing and crashing of the two ships against each other's sides—was altogether a scene for half an hour which cannot be described. At last our ship was brought up in forty-seven fathoms water, which brought us head to wind; and after much destruction of the rigging of both ships, the stranger fell off, leaving part of her rigging on our deck. We then found that we had been run foul of by the *Latona* frigate belonging to the grand fleet, then beating down the channel on a cruise, after repairing the damage sustained in the glorious action of the previous 1st of June.

When it was found that the ship made no water, orders were given that the fore-tackles be got to the *night-heads* to secure the fore-mast, now deprived of its fore-stays (as the *Latona* had carried away the bowsprit, figure-head, both cat-heads, and one anchor which brought us up). Before, however, the foremast could be secured, or the cable could be cut to get the ship again before the wind—the ship riding heavily—the foremast went by the board, falling directly back on the mainmast. The fall of the whole now appeared inevitable. The men on the main and mizzen tops were desired to come down, and every one on deck were loudly called upon to take care of themselves. At last the mainmast also went by the board, carrying with it the mizzen-mast and every particle of standing rigging abaft. The thundering noise of such a weight of masts, yards, rigging, and sails, (which were clewed up, but not furled,) all falling in-board, was most appalling. A deep silence of a few seconds only succeeded, but neither groans of the dying, nor cries of the wounded were heard; for although the deck was crowded with people not an instant before the fall of the masts, not a man was hurt, the greater number having rushed into the captain's apartments while the masts were falling.

Two or three men who lingered in the main-top came down therewith, but luckily falling between the hen-coops on the poop among the cordage, escaped with only very slight bruises. The corner of the

main-top was forced through the poop-deck, and nearly killed an officer who was nearly under the place. The whole of this catastrophe happened in little more than half an hour, and from the state of a towering well-found ship, was reduced to an unmanageable but still sound hulk, covered with wreck.

Some of our readers may ask, perhaps, why we have given so long a detail of this unlooked-for accident to the ship, as having nothing to do with the transportation of plants; but they will be able to assign a reason, and we hope an excuse, for the account, when we inform them, that on visiting our plants at daybreak next morning, we found the platform and all the boxes, with what remained of the plants, more or less crushed under the weight of the main and mizzen masts, both of which fell directly along the platform, and pressed the whole close to the deck.

At daylight we found ourselves directly off Plymouth, and in the midst of the grand fleet under Lord Howe. Several other Indiamen, as well as King's ships, disabled like ourselves, were near; but the greater part of our old companions had passed up the channel. Lord Howe, after hailing us and learning the particulars of our disaster, ordered us to be towed into Torbay by the *Venerable* seventy-four, Captain Sir John Ord, to which place the whole of the grand fleet and disabled Indiamen returned, and anchored on the evening of the same day.

(To be continued.)

OBSERVATIONS ON THE CHANGES OF SYSTEMATIC BOTANY.—

It is generally known that systematic botany has been for a good many years past in what may be called a state of revolution. The great change introduced by the elder Jussieu, in departing so completely from the sexual system of Linnæus, has disturbed the minds, and unsettled the early-acquired ideas, of most botanists; and although the scheme and principle of Jussieu has been readily and pretty generally adopted by a very great majority of the highest class of scientific men, yet, as the labours of that eminent man were not, nor possibly could be complete, his talented disciples are every day adding what he has omitted, replacing what has been misplaced, and defining and determining what he has left undetermined. It is also obvious that, in this business of amending the Jussieuan system, botanists of equal abilities and powers of discrimination, do not always agree in opinion—not only as to the true generic character of the same plant, but differ materially respecting the natural order to which it really belongs.

Whether these differences arise from any defect in the system itself,

or for want of a thorough knowledge of its details, is perhaps uncertain; but it is quite clear that the rules laid down by Jussieu for identifying the genera and types of the orders instituted by himself, are not so definite as that "he who runs may read," otherwise there could not be two opinions respecting any one perfect plant. But the distinctions between genera, and even between some of the orders, when differentially considered, are so alight, that there is no wonder that discrepancies occur among botanical authors.

This indefinite character of the new system has induced several practical botanists to conceive that a yet more simple and perfect natural system may be devised than that of Jussieu, which would render the study of the science much more easy and agreeable. When the author of the natural system was employed in its arrangement, he sometimes met with a tribe of plants which he considered might have formed a *vast genus*, rather than a separate order; and several botanists of the present day begin to perceive that making the system less diffuse would be an improvement.

We quote with much pleasure what Professor Lindley has written on this subject in his "Introduction to Botany," p. 320, as we believe it evinces a very just view of the present state of the science.

"Properly speaking, this system" (the Jussieuan) "is subject to no kind of artificial arrangement: it consists of certain groups called natural orders, all of which are, or should be, independent of each other, and the characters of which are derived indifferently from every part of the plant. But as it would be extremely embarrassing to the student to acquire a just notion of these groups, unless some mode were devised of analysing their characters, several plans have been invented by which the groups have been reduced to a sort of artificial arrangement, with greater or less violence to their mutual affinities. As all these plans must, as has been shown, necessarily be linear, the real affinities of plants must be very imperfectly indicated by them; they are, therefore, of no value whatever, except for the purpose of facilitating investigation. They must be understood to form no part of what must be strictly called the natural system; they may be varied at pleasure, according to the ingenuity of the botanist; and that will be the best which is most facile, and which at the same time offers the fewest interruptions to the series of mutual relations. At present, I think," continues the Professor, "there are few botanists who will deny that they are all extremely defective; and that one of the greatest services that could be rendered to systematic botany, would be to devise some scheme by which the orders could be better and more naturally arranged under their primary classes. Whoever does this, will have to

divest himself of all the prejudices—and they are not a few—which have grown up with the system of Jussieu, and that have taken deep root in the minds of his followers: he must judge for himself upon every single point that may come before him; and he must forget that any such artificial arrangements have existed as those of Jussieu himself, De Candolle, and others. It is even to be expected that the organs of vegetation will be, for this purpose, employed even more than those of the fructification; and that anatomical characters analogous to those which characterise the really natural primary divisions of *Vasculares* and *Cellulares*, and of *Exogenæ* and *Endogenæ*, will be applied to the grouping, in subordinate masses, of the orders themselves.

“At present (1832) scarcely any attempts of this nature have been made, except by Agardh and Bartling; but the endeavours of those botanists, however meritorious, are far from coming up to what may be expected.”

From the foregoing observations, and from many other opinions appearing in the literary labours of Dr. Lindley, as in his “*Nixus Plantarum*,” &c., it is evident that he sees before him an ideal semblance of a simpler, and consequently more harmonious, scheme of systematic botany than that of Jussieu, or at least a simplification of that eminent botanist’s plan, embracing the essentials alluded to in the passage quoted above.

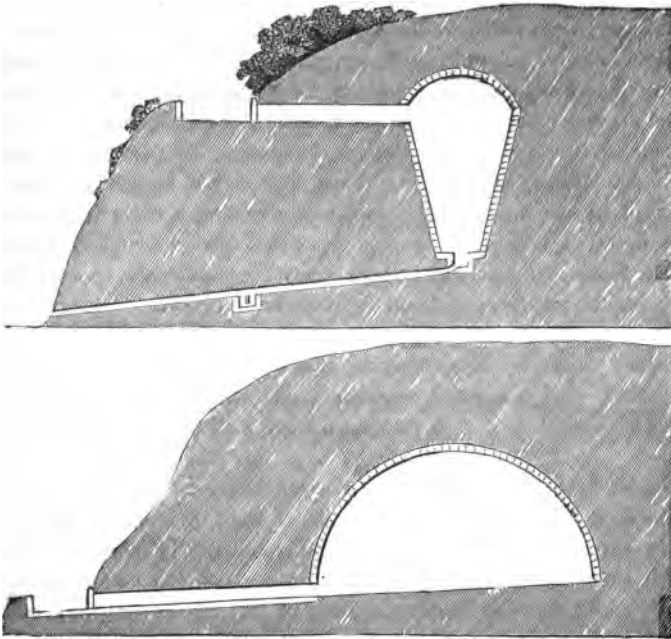
The possibility and practicability of such a thing are thus admitted, and the necessity of it every one must allow is universally evident, on comparing together the descriptions of different botanical writers. Not only in the monthly periodicals of our own country, but among the equally erudite authors on the continent, we can notice discrepancies, which show that the writers have not all been taught in the same school, or under the same master.

There is no hope that the remodelling of the Jussieuan system will ever be accomplished by the labour of any one man; it should be undertaken by an association of professors, each of whom should not only be good practical botanists, but also have at hand a full botanical library, and, what is still better, a well-selected classified herbarium. When the principles and the grand outline of the new system are once fixed and adopted, the details might be completed consecutively, as leisure or opportunities allowed.

The following extract from the excellent address of Earl Stanhope, President of “The Medico-Botanical Society,” for the anniversary meeting, January 16th, 1836, bears materially on some of the points above stated:—

“ It is only when applied to purposes of practical utility, which are alone of real importance, and which ought constantly to be the objects of our pursuit, that botany can be of value ; for it would have very little merit, and have no claims to our attention, if it were to be confined, as is too frequently the case, to the complete enumeration and minute description of plants, or even to their systematic arrangement, which, notwithstanding all the care and industry that have been bestowed upon it, seems to be still far removed from the perfection which is so much to be desired, and will, I have no doubt, be ultimately attained. The imperfection of the present nomenclature and classification is evinced not only by the multitude of synonyms, but also by innumerable cases in which the same plant is arranged in a different genus, by some botanists, from that which others have considered it to be more appropriate. Hence arise that *uncertainty and confusion* which is so injurious to botany itself, and so inconvenient to those who study it : and hence we may reasonably infer that the present is not *entirely* satisfactory, even to those who are the most competent authorities upon the subject. Although Linnaeus classed the whole vegetable kingdom into *fifty-seven* natural orders, they have since been increased to the number of *two hundred and twenty-nine*, some of which have been again divided into tribes, sections, and sub-orders ; while there are *thirty-four* orders, each of which contain only two genera, and about as many other orders comprising only a single genus, and in some cases a genus which has but one species. While some plants, like the mignonette, the pomegranate, and the *Cobæa scandens*, appear to be thus unsociable, there are others which, notwithstanding all their dissimilarities, are classed together ; and the elm, the hop, the fig, and the nettle, are included by Jussieu in the same order, and according to what is called a natural arrangement. According to another classification, the elm belongs to the order *Ulmideæ* ; the fig, to the *Artocarpeæ* ; and the hop, with the nettle, to the *Urticeæ*. Classification is the more important, because plants which are similar in their characters are so likewise in their qualities, and ought to be arranged in such a manner as to facilitate the investigation by analogy. The advantages to be derived from that analogy would of themselves offer a sufficient recommendation to the study of botany, which is also of extreme utility in establishing those precise and accurate definitions by which each plant may be recognised, and may also be effectually distinguished from every other. The study must, however, be pursued with reference to some practical object, without which it becomes uninteresting to ourselves, and unprofitable to others.”

ON THE CONSTRUCTION OF ICE-HOUSES.—A correspondent, whom we feel willing to oblige, has requested our opinion as to the best and most convenient form and manner of constructing an ice-house. By way of answer, we might have referred our correspondent to what we have written on the subject in our number for December last; but, lest he should not have that number at hand, we shall at present make a few additional remarks, and add here (what was omitted then) two sections of ice-houses, to which we then alluded.



The first is the common form in which ice-houses are built; the second is a section of another, (see page 478,) which, though we have never seen executed, we have, however, no doubt would answer the purpose as well, and certainly be as easily filled, and much more convenient for getting out ice when required.

We may repeat, that there are two sources of heat to be guarded against in constructing an ice-house, viz. solar heat, and that which is ever rising from the interior of the earth. The former is the most destructive to ice, because its medium is air; whereas the latter is usually conveyed through the medium of water either in a condensed

or evaporated state. To repel the first, thick walls and roofs formed of materials *the least conductive of heat* are necessary; and to guard against the ascent of subterranean heat, a floor of thick stone pavement should be laid on a substantial foundation of compactly-rammed clay. Where there is a natural foundation of rock or clay, common brick pavement may suffice.

Besides ice-houses, there are what are called hovels, which are said to keep ice as well as those built with bricks or stone and mortar. These hovels have a frame formed of any rough scantling, of the required size, and either round or square. The floor should be somewhat higher than the surrounding surface, and its place should be sheltered and shady. An old chalk or gravel pit in a wood is an eligible place. The walls and roof should be formed of wheat stubble, laid and bound on as compactly as possible, and the thicker the better; because the thicker this is the better the ice will keep. To prevent rain sinking into the fabric, both the walls and roof should be well and thickly thatched in the manner of a corn-rick, forming a cone with a very large base. The body of broken ice within should be piled also in a conical form, and the vacant space above the ice should be well filled with loose straw, to exclude all air from the interior.

The entrance should be towards the north, and no larger than it absolutely need be for getting in and out the ice: the door being, when shut, always covered up with litter. Such hovels are common in the United States of America, and are said to answer the purpose well.

The above section, B, is that of a circular ice-house, supposed to be formed in the north brow of a hill; or, if built on level ground, to be deeply covered by earth, or other thick roofing. It is not necessary that it should be circular, as an arched vault of any length might do equally well; but the larger the body of ice, the less rapidly will it melt, if sufficiently broken and secured from air.

ON THE PINUS AUSTRIACA, or *Black Fir of Austria*. By Mr. CHARLES LAWSON, seedsman to the Highland and Agricultural Society of Scotland.

“Two years ago my attention was directed to the *Pinus Austriaca*, or *Black Fir of Austria*, from seeing a description of it in a work by Francis Hoss, Professor of the Science of Forestry in the Imperial School of Forestry at Mariabrun, near Vienna, entitled ‘Guidance to determine the Trees and Shrubs of Austria;’ in which, by a long and minute botanical description, he proves this fir to differ essentially from all the others described by him, in that it naturally thrives best on,

cold, dry, poor, sandy or gravelly soils, and that it grows rapidly and yields timber of the best quality. During my visit in 1834 to the continent, finding that, since Professor Hoss's publication had appeared, much attention had been directed to this valuable tree—and understanding that the best authorities coincided in stating that cold stony soils, rocky situations, and rough climates are best adapted for it, and that it there thrives much better than any other tree—and also that deep rich soils, warm situations, and warm climates are quite unsuitable for it—and, further, that it grows vigorously on plains of poor soil, if it be dry and contain a quantity of broken stones or gravel—it appeared to me that the introduction of so valuable a tree into the forests of our country was an object of some importance.

“The timber of the black fir is represented to be very resinous, firm, and tough, and very valuable for all water-work purposes, in which it is greatly preferred to larch, as also esteemed by the joiner and cooper. When used as fire-wood, it produces a speedy and long-lasting heat, burning with a violent flame, and throwing off a large quantity of pine-soot (lamp-black). For making charcoal, it is preferred to the wood of the beech. The chips of the timber are used by the peasantry in several parts of Austria for lights, in place of candles; and it produces more turpentine than any other resinous tree.

“In Austria, this fir predominates in the Wienerwald, the Banate, on the Domoglet at Mehadia, near the Hercules Baths, in the vicinity of the Austrian snow mountains, where it rises higher than the *Pinus sylvestris*. Through the medium of my friends, Messrs. Booth of Hamburgh, I obtained a quantity of the seeds last year, which have grown luxuriantly in our nursery on light soil, having long penetrating roots; and, as one-year-old plants, they are double the size of our own country Scotch fir. The seeds pretty nearly resemble those of the *Pinus Laricio*, but from which the tree differs essentially, and is easily distinguished in an advanced state by having stronger and more spreading branches, and the leaves or needles wanting that tortuous appearance which those of the *Pinus Laricio* present.

“Having had an opportunity of conversing with M. Vilmorin at Paris about it, in the summer of 1835, I found that he was aware of its valuable properties, and considered it of quicker growth than even *P. Laricio*, or Corsican pine, and that it is nearly allied to the *Pin de Calabre* and *de Romanie*, both of which are little known in this country, and I believe not so quick in growth as the *P. Austriaca*, nor so well fitted for the mountainous districts of Scotland, for which I should

consider the black fir of Austria to be eminently suitable."—*Quart. Journ. Agri., June, 1836.*

ON STORING POTATOES. By SIR G. S. MACKENZIE, Bart.—“Of various methods I have tried for preserving potatoes from frost, that practised most commonly seems to be the best, viz. making a shallow pit about a foot and a half deep, on a dry spot, and heaping the potatoes like a roof, to the height of about four feet. On the heap thus formed straw is laid to the thickness of about eight inches, and over this the earth taken out of the pit, the whole being beaten firm by the back of a spade. Some time before the end of February, or beginning of March, the pit is opened, and the potatoes turned over, all shoots being picked off. After the heap is turned over, it may be again covered, and the potatoes allowed to remain a month longer, after which they should be removed to a barn or shed and picked. They should now be frequently turned over, and picked free from shoots. If the eyes of a potato be scooped out, it will gradually dry, if properly exposed, and it may then be scraped into flour, though not very white. In this state they will keep for an indefinite time; and as there is no risk of them becoming mity, as wheat flour does, dried potatoes might be found useful during long voyages, though potato flour is better.

“It ought to be generally known that there are varieties of the potato which, though sufficiently protected from frost, will not keep, *under any management*, for more than a few months;—do what we will they decay, owing to their natural constitution. Other varieties again will keep very long without any trouble: hence premiums should be offered for raising new varieties from seed possessing as many as possible of the qualities desirable in a potato. Long keeping is a particular property belonging only to some, and not to all varieties.

“Some varieties of the potato are best for the table early in winter, and others best in spring.” There has been much complaint of potato-sets rotting in the ground for the two last years—“none of my own,” adds Sir George, “were affected, but some of my tenants lost large patches. I observed a wire-worm on some of the decayed sets; but whether this worm was the cause of the failure, or the failure of the the set induced the insect, from whose eggs the worm proceeded to lay them on the set, I could not ascertain.”—*Ibid.*

Sir George, from numerous experiments, is fully convinced that sets are preferable to whole tubers for yielding a crop.

NOTICES OF BOTANICAL PUBLICATIONS.

EDWARDS'S BOTANICAL REGISTER, continued by Professor Lindley.
The July number contains:—

1. *Kerria Japonica* of De Candolle, formerly the *Corchorus Japonicus* of Thunberg. The common one with double flowers is well known, and the history of this single-flowered one is given in our last number, pages 274-5. The plant belongs to the order *Rosaceæ*.

2. *Cratægus platyphylla*. Broad-leaved Thorn. This "certainly, in foliage and elegance of general appearance, is the handsomest of the European hawthorns. It grows like an exceedingly vigorous *Oxyacantha*, spreading its gracefully bending arms on all sides. Its leaves are a deep rich green; it is loaded with large masses of snow-white blossoms long after the common hawthorn is flowerless, and it retains its vigour till late in the autumn, so that the rich colour of its blackish-purple fruit is not impaired in effect by the fading tints of the foliage."

3. *Bifrenaria aurantiaca*. Orange-coloured Bifrenaria. A pretty orchideous epiphyte from Demerara, which flowered at the Duke of Devonshire's, Chiswick, in October, 1835. The flowers are yellow, spotted with purple, and resemble several others of this tribe of plants.

4. *Iris alata*. Small-winged Iris. A beautiful single-flowered Iris, found in most places in the south of Europe. It was communicated to Dr. Lindley from Abbotsbury, by the Hon. W. F. Strangways, with whom it flowered in an open border, requiring but a slight protection from frost.

5. *Cratægus pyrifolia*. Pear-leaved Thorn. This species is known from all others by the strong plaits which give the leaves somewhat the appearance of being furrowed from the mid-rib towards the margin. The haws are pear-shaped, and of a reddish-yellow; flowers in June, and is perfectly hardy, being a native of North America.

6. *Scilla Cupaniana*. Cupani's Squill. A species found in Sicily, and sent from thence by the Hon. W. F. Strangways. It is rare in this country, and bears a spike of small purple flowers.

7. *Epidendrum bifidum*. Hare-lipped Epidendrum. A remarkable and distinct species, found growing on trees in several of the West India Islands. Messrs. Loddiges received it from Tortola, with whom it flowered in July, 1835. The flowers are beautifully elegant, as well as curious in form.

8. *Godetia vinosa*. Wine-stained Godetia. The Godetias are a new genus, lately separated from the old genus *Cenothera*; of course it belongs to the natural order *Onagrarina*. It was introduced by the Horticultural Society from California, and proves a hardy annual well worth cultivation. It is very nearly allied to *G. rubicunda*.

SWEET'S BRITISH FLOWER-GARDEN, continued by Professor Don. The July number contains:—

1. *Rhododendron arboreum*; var. *undulatum*. Wavy-leaved Tree-Rosebay. A bushy evergreen with purple branches, bearing deep purple flowers, variegated with a whitish centre spotted with yellow. The petals, as well as the leaves, are remarkably wavy at the edges; hence the specific name.

This variety originated with Mr. Smith, at Norbiton Common, from whose collection the drawing was taken in May last; it surpasses all the other varieties in the deep purple of its blossoms. The plant is apparently quite hardy.

2. *Ismelia Madeirensis*. Madeira Ismelia. This is a rather elegant shrubby species, very recently introduced by Mr. Webb to our collections. The plant belongs to *Compositæ*, and has formerly been referred to the genus *Pyrethrum*. Its glaucous, gashed leaves, and star-like yellow flowers, render it a rather striking plant. It requires a greenhouse in winter.

3. *Fritillaria Ruthenica*. Russian Fritillary. A neat little species of Fritillary, received by Dr. Neill under the above name. It is a stranger to our collections, and is remarkable for its diminutive size, as compared with some of its congeners.

4. *Lathyrus Magellanicus*. Cape Horn or Lord Anson's Pea. "Few plants," says Mr. Don, "are more worthy a place in the flower-garden than this lovely Lathyrus, not less on account of its remarkable habit, than of the extreme beauty and delicacy of its blossoms, which are produced abundantly during the month of June. The plant was originally introduced into this country by the cook of his Majesty's ship *Centurion*, commanded by Lord Anson, in 1744, and was cultivated by Mr. Miller in the Apothecaries' Garden at Chelsea; but it appears to have perished shortly afterwards, otherwise a species so highly ornamental could not fail to have become generally cultivated." It is not quite hardy, though it stood out, trained to the front of a house, all last winter without sustaining injury, in the nursery of the Messrs. Osborne, at Fulham, and flowered beautifully in June last. It is a maritime plant, which circumstance should be considered in its culture.

PAXTON'S MAGAZINE OF BOTANY. The number for July contains :—

1. *Phacelia vinifolia*. Vine-leaved Phacelia. This is a pentandrious annual, belonging to the natural order *Boraginæ*. The seed from which the plant was obtained was imported from Texas by the late respected Mr. Drummond. The specimen figured was from Mr. Campbell, curator of the Botanic Garden at Manchester. An open, rich, loamy spot will suit it, and the readiest way, it is expected, to propagate it will be by seeds.

2. *Azalea Rawsonii*. Mr. Rawson's Azalea. A hybrid production between *Azalea Phœnicia* and *Rhododendron dauricum atrovirens*, raised by Mr. J. Menzies, gardener to Christopher Rawson, Esq., F.G.S., of Hope House, near Halifax.

Mr. Paxton not only approves very much this result of manual impregnation, but earnestly recommends to every one the practice of hybridisation, for the purpose of originating new floral beauties, in which he promises to co-operate.

3. *Begonia platanifolia*. Platanus-leaved Begonia. A very ornamental species of this curious genus of stove-plants. The flowers are monœcious, (though the female flowers are not represented in the plate,) and the foliage is conspicuously different from that of the others. It is said to be rare in this country.

4. *Dichorizandra thyrsiflora*. Thyrsé-flowered Dichorizandra. A hexandrious plant belonging to *Commelineæ*. It is a handsome stove-plant, easy of cultivation—a ready flowerer, bearing many rich blue blossoms on a longish spike. It is a suffruticose perennial, with broad, dark-green leaves, and requires abundant watering when growing freely.

Following the figures and descriptions of the foregoing plants, there are several useful essays on different subjects; the first is "Some Account of the Natural Order *Myrtaceæ*," in which the changes it has undergone since first projected by Jussieu are detailed; next follows "Directions for forming and furnishing Ornamental Basket-work for Flower-Gardens," with diagrams showing their forms and effect; also what is called "An Exposition of the Genus *Pæonia*," in which a list of the different species and variations of both the shrubby and herbaceous sorts is given, together with some account of their merits and culture. Next are given "Directions for forming a Rosary of Scotch Roses," with a diagram and list of all the favourite sorts. The plants figured and described in the Botanical Register, Botanical Magazine,

British Flower-Garden, and the Florists' Magazine, for the month of May, are also given, together with "Operations for July" in the stove, greenhouse, and flower-garden.

SMITH'S FLORISTS' MAGAZINE. The number for July contains:—

A finely-drawn and coloured figure of the celebrated Tulip the *Dutch Catafalque*; to which is annexed some very fair criticisms, and some very good advice to both sellers and buyers of Tulips. Mr. Smith has added a copy of the prices obtained at a sale of Tulips at Alcmaer, in Holland, in the year 1637, as a proof of the *Tulip-mania* so prevalent at that time in that trafficking country.

One hundred and twenty bulbs sold for	£8,437	10	0
One, the Admiral of Enchuysen, with its offsets	487	10	0
Two Brabanters	356	5	0
One, the Viceroy, sold for	394	0	7½

Not only the names and prices of these bulbs, but also their weights, are particularly set down in the City Register.

The second plate represents the *Victoria* and *Polyphemus Calceolarias*, of the whole family of which Mr. Smith gives a very good account. "They may be divided," he says, "into four classes—the annual, biennial, perennial-herbaceous, and perennial-shrubby. The latter are the greatest favourites, and promise to be hardy enough to stand our winters."

The third plate exhibits three fine Carnations, viz. *Bertrand*, *Prince de Nassau*, and *Bijoux de Clermont*, drawn from specimens in Mr. Hogg's collection.

The fourth plate shows a specimen of the *Mimulus Wheelerii*, or Wheeler's Monkey-Flower. This, of the many varieties now in cultivation, is the most showy, and should be in every collection. There is also in the number a beautifully engraved cut of the *Tropæolum tricolor*, with description and directions for culture. "In purchasing plants which are rather costly, care should be taken to ensure a fair-sized bulb" (tuber is meant).

NOTICES OF BOOKS.

FLORIGRAPHIA BRITANNICA; or Engravings and Descriptions of the Flowering Plants and Ferns of Britain. By RICHARD DEAKIN, F.R.C.S.E., and ROBERT MARNOCK, Curator of the Sheffield Botanical and Horticultural Garden.

THE FLORICULTURAL MAGAZINE AND MISCELLANY OF GARDENING. Conducted by ROBERT MARNOCK, Curator of the Sheffield Botanical and Horticultural Garden.

Through the civility of the publishers we have been favoured with eleven numbers of the first of these works, and number one of the second. Both will be highly useful, more especially for those who have neither time to peruse, nor means to purchase, large and expensive works. The first is intended to be published in monthly numbers, demy 8vo, price sixpence, and was commenced August 1st, 1835. We quite agree with what the authors have advanced in the address printed with the first number, that "it will be found of especial utility to young gardeners, and all persons who are desirous of obtaining a knowledge of our native plants, while it may be found not unacceptable to the scientific botanist." Each number contains twelve figures, six on a page, with letter-press descriptions of the whole. An edition will also be published with coloured plates, price one shilling.

Considering that the descriptions are taken from the first authorities—that both generic and specific characters are added—history, uses, and localities given—and that the figures, though small, are faithful, and cannot easily be mistaken—we must come to the conclusion that it is the cheapest, as well as one of the most useful, works on British botany ever offered to the public.

Of the FLORICULTURAL MAGAZINE we augur well; it is called for by the prevailing and universally increasing taste for flowers and every other branch of horticulture. The conductor's station as curator of a highly respectable and prosperous botanical and horticultural garden, will afford and be ever supplying him with objects for discussion or representation in his periodical. He is also well known and much respected among his brethren, whether scientific botanists or practical gardeners, and consequently will command, no doubt, an extensive correspondence. He is also favourably situated for ensuring a large circulation of his magazine: a very great majority of manufacturers, whether masters or operatives, are enthusiastically fond of flowers and small fruits, and Mr. Marnock's cheap work is, therefore, well adapted for such amateurs.

The complexion of this first number promises well; it contains some valuable original floricultural matter, and a great mass of floricultural intelligence. The embellishments are a plate of three of our newest and much-admired plants, namely, the *Clianthus punicus*, *Mahonia repens*, and the *Brugmansia sanguinea*, very well executed, and accom-

panied with descriptions. There is also an engraved perspective view of the middle walk, fountain, and buildings of the Sheffield garden, which, from the annexed account, appears to be really a splendid establishment—the whole being designed and arranged by the curator. There is no doubt but that the Floricultural Magazine will receive a full share of public patronage, and we wish it every success.

EXHIBITION OF THE HORTICULTURAL SOCIETY.

ON Saturday, the 9th inst., the third (and last for the season) of the Society's exhibitions of flowers and fruit took place at the garden. The attendance was very numerous and fashionable. Between six and seven thousand of the rank and beauty of the metropolis were present. The weather was extremely propitious, which doubtless was one great cause of attracting such a number of visitors. The shows of flowers and fruit were equally varied and rich. The prizes were distributed as follows:—

The Gold Knightian Medal.—S. Rucher, Esq., for a collection of *Orchideæ*; Messrs. Rollison, *Oncidium lanceanum*; Mr. Green, gardener to Sir E. Antrobus, stove and greenhouse Plants.

Large Silver Medal.—Mr. Gaines, *Alstræmerias*; C. Palmer, Esq., *Melo-cacti*; Mr. Davies, gardener to Lady Clarke, Grapes; Messrs. Rollison, collection of *Orchideæ*; Mr. Hill, gardener to N. M. Rothschild, Esq., Queen Pine-apples; Mr. Errington, gardener to Sir G. P. Egerton, Peaches; Mr. Glenny, Chinese Roses; Mr. S. Hooper, Roses; Mr. Lane, gardener to J. H. Palmer, Esq., Roses and greenhouse Plants; Mr. Redding, gardener to Mrs. Marryatt, single specimen of a New Holland Plant; Mr. Rivers, of Sawbridgeworth, collection of Roses.

The Silver Knightian Medal.—Mr. Cock, Chiswick, Balsams; Mr. Hogg, Picotees; Mr. Snow, gardener to Lord de Grey, Cucumbers; Mr. Mills, Cockscombs; Mr. Dennis, *Melo-cacti*; Mr. Redding, Ferns; Mr. Buck, Grapes; Messrs. Lane and Son, Heartsease; Messrs. Rollison, Heaths; Mr. Clarke, Melons; S. Rucher, Esq., *Gongora*, a new species; Mr. Cock, Pelargoniums; C. G. Cooke, Esq., Providence Pine-apple; Mr. Gibbs, Nectarines; Mr. Niemen, ditto; Mr. S. Hooker, Roses; Mr. Ward, Maresfield, Garden Roses; Mr. Paul, Cheshunt, Garden Roses; Mr. Redding, single specimen of a stove Plant; Mr. Spence, ditto; Mr. D. Ferguson, single specimen of a greenhouse Plant; R. Mangles, Esq., specimen of a New Holland

Plant; Mr. Douglas, ditto of a Cape Plant; Mr. Marshall, for a hardy herbaceous Plant.

Silver Banksian Medal.—Mr. Jackson, Calceolarias; Mr. Gaines, Pelargoniums; Mr. Paul, Chinese Roses; Rev. Mr. Hinks, for *Droseras* cultivated under glass; Mr. Myers, Brentford, Cherries; Mr. Mills, Hydrangeas; Mr. R. Scott, large Fuchsias; Mr. Buck, *Crassula coccinea*.

The Judges were, H. M. Dyer, Esq., Mr. Greenshields, Dr. A. Henderson, W. Herbert, Esq., T. Ingram, Esq., Mr. Macintosh, and Mr. Richardson.

The company continued arriving as late as six o'clock, and remained till half-past eight.

STAMFORD HILL HORTICULTURAL READING SOCIETY'S LIBRARY.

SIR,—At the time an article, at the commencement of the present year, appeared in your Register, dated "Chiswick House Gardens," on the subject of Gardeners' Societies, I was inclined to communicate with you on the formation of them; but really the contemptuous manner in which your correspondent alluded to the one established here, without having made necessary inquiries respecting it, then restrained me, for it has never been my wish to enter into any unfriendly controversy. Now that the Committee of Management of this Society (to which I have the honour to be Secretary) have printed a concise report on the present state of its affairs, and as it appears to me that its objects embrace the essence of all those proposed by him and others who gave their opinions in your after numbers, I am induced to send you a copy of that report, list of members, catalogue of books, and rules for your consideration, assured by practical experience of the benefit the gardener and his employer necessarily must derive from such an institution. This Society is patronised by influential honorary members, is supported by them and sixty-five other members, including nurserymen, most of the gentlemen's gardeners in the neighbourhood, and amateurs, all anxious to impart and receive information in the sciences of Horticulture and Natural History. Such information is not only obtained by mutual friendly communication, but by reference to our valuable and fast-increasing library, (which you will observe is a circulating one,) and by monthly meetings for the production of plants and specimens, the mode of culture of which is freely discussed, and a perfect knowledge of their habits, &c., sedulously sought for.

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Should similar societies be formed in the vicinity of London, (indeed I hope soon to see them established in many parts of the kingdom,) I shall feel great pleasure in communicating with the members, and furnishing them with any required information relating to this one; for I am confident that it is most useful, well-founded, and worthy imitation.

I am, Sir, your obedient humble servant,

E. A. HUTTON.

RULES OF THE STAMFORD HILL HORTICULTURAL READING SOCIETY, established November the 6th, 1833.

At a meeting held this day, at the house of Mr. S. Gill, the sign of the Bird-Cage, Stamford Hill, it was agreed to form a Society for the advancement of Horticultural Knowledge, by the purchase of useful books and publications in the various departments of Gardening, Farming, Forest-planting, and Rural Economy, in order to form a Library for the use of its members, when the following Rules were agreed to, by the parties present severally subscribing their names thereto.

" 1. Resolved, That this Society be denominated the '*Stamford Hill Horticultural Reading Society*,' for the Study of Botany, Natural History, and Rural Affairs.

" 2. That on admission to this Society every person shall pay an entrance-deposit of ten shillings, and a subscription of two shillings and sixpence per quarter thereafter, so long as such individual shall belong to this Society; and for transacting the general business, the third Tuesdays in January, April, July, and October, shall be quarterly nights, when each member shall clear his account of quarterage and fines, or forfeit sixpence. The Secretary shall give notice to such defaulter, that unless his quarterage and fines be paid on or before the following quarterly night, he will be excluded. The first Tuesday in each month shall be the monthly night, when the business of the Society shall commence at seven o'clock precisely, as also at the quarterly meetings, and all propositions ready for ballot shall be then determined.

" 3. That any person of good moral character may belong to this Society, on being nominated by some member of the Committee of Management at one meeting, and admitted at the next meeting, by the majority of two-thirds of the members present voting by ballot for such admission, and by paying the usual fees; and any person who has once been balloted for, but not admitted, shall not be again put in nomination.

" 4. That, for the benefit of this Institution, persons favourable to the advancement of its objects be received as honorary members, on payment of one guinea per annum, or, by the payment of five guineas, shall become honorary members for life.

" 5. That any member changing his place of abode shall, within four weeks from such change, insert his removal in the Residence-book to be kept for that purpose, or be fined one shilling.

" 6. That a Treasurer, Secretary, and Librarian shall be annually elected, on the quarterly night in January, the former of whom shall hold all documentary papers.

" 7. That the property of the Society shall be vested in the hands of three members thereof, as Trustees, who shall be elected by ballot on the first quarterly

meeting; any vacancy which may occur by death, or otherwise, shall be filled up at the next quarterly meeting. Each Trustee shall be furnished with an inventory of every article belonging to the Society.

" 8. That twelve members of the Society be appointed to constitute a Committee of Management of its affairs, whenever it may not be necessary to call a general meeting of the Society; and that the Treasurer, Secretary, and Librarian be, by virtue of their office, members of the said Committee of Management, in addition to the twelve before named.

" 9. That the Committee of Management shall be composed of the twelve senior members of the society; and that the four senior members of the Committee shall annually retire, and their places be supplied by the four next in rotation on the list of subscribers; and that any member refusing to undertake the above office be fined two shillings and sixpence.

" 10. That the Committee of Management do at least meet once a month, or oftener if requisite, such monthly meeting to be held on the first Tuesday in every month, and that not less than three members, exclusive of the officers, do form a quorum; and all Committees shall have full power to impose such fines, and to make such rules and orders, as may be necessary to produce punctuality in their meetings.

" 11. There shall be three Auditors chosen by the Society at the annual meeting, who shall make their report quarterly.

" 12. That, for the purposes of this Society, such books be procured and circulated as are of practical utility; and that no work be admitted which has a controversial, immoral, or irreligious tendency; and that such order be adopted in the circulation of the books as shall best secure to each member an equal share in the benefits of the Institution.

" 13. That any subscriber may propose a book to the Committee of Management at one meeting, and its purchase be decided upon by them at the next meeting.

" 14. That every book purchased by the Society be entered by the Librarian in a book to be provided for that purpose.

" 15. That upon any member changing his residence to a distance of more than three miles from the Society's Rooms, he shall be entitled, if within the term of two years from his admission into the Society, to the amount of his entrance-money in cash.

" 16. That the Librarian be provided with a book so ruled that each member may sign his name upon receiving a book from the library, and likewise the same in the opposite column on its return.

" 17. That every book, on being issued for circulation, shall be accompanied with a list having columns in which to mark the times of reception and delivery; and for every day any book shall be kept over the time specified, a fine of three-pence shall be exacted; sixpence for neglecting to mark the list, and two shillings for losing the list entirely.

" 18. Any person taking a book from the library without permission of the Librarian, shall be fined five shillings.

" 19. The Secretary shall enter all By-laws in a book to be kept for that purpose, and shall read the newly-enacted ones publicly every quarterly night; and all By-laws shall be binding on the Society "

N. B.—The Society contemplate the hiring of a private room for the purposes

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of meeting in and containing a library, when the funds of the Society will permit.

Committee of Management.—Mr. J. Curry, Mr. J. Cleverly, Mr. W. Watts, Mr. J. B. Shaw, Mr. J. Adamson, jun., Mr. J. Welch, Mr. F. Fraser, Mr. W. Adamson, jun., Mr. W. Wilson, Mr. C. Wharton, Mr. J. Clark, Mr. T. Gillan.

The Committee of Management, in submitting the following Report, congratulate the Society upon the progressing prosperity of its affairs. It is gratifying to them to be enabled to state, that the whole of the expenses incidental to the establishment of the Library and Reading-Room, as contemplated at the institution of the Society, has been defrayed, (including the enlargement of the room, the purchase of book-case, books, &c.,) that there is not any outstanding demand upon the Society's funds, and that the balance in the Treasurer's hands is highly satisfactory, as will be seen by reference to the account.

They solicit from all well-wishers to the Institution presents of books, as they will greatly facilitate its objects, and will be thankfully acknowledged: they hope for a continuance of the support of honorary members, and rely upon the exertions of the members generally to promote its welfare and usefulness.

An Account of Receipts and Payments from 21st April, 1835, to 19th April, 1836.

<i>Receipts.</i>			<i>Payments.</i>		
	£.	s. d.		£.	s. d.
To balance of account, 21st April, 1835	-	9 2 0	By rent from Christmas, 1834, to Lady-day, 1836, and for attendance	-	17 10 0
Subscription from honorary members	-	8 8 0	Mr. T. Blair, for the use of his room prior to the present one being occupied by the Society	-	3 0 0
Subscriptions, fines, and admissions	-	34 2 3	Messrs. Longman and Co. for books	-	12 16 4
			Book-binding	-	0 19 0
			Printing	-	0 17 6
			Stationery	-	1 5 2
			Coals, &c.	-	0 19 3
			Mr. C. Broadbridge, for Painting	-	1 7 0
			Balance in Treasurer's hands	-	12 18 0
	£51	12 3		£51	12 3

(Signed)

GEORGE PRESS, *Treasurer.*

THOMAS W. BUCKHAM,

SAMUEL GARLAND,

THOMAS SEEAR,

} *Auditors.*

A LIST OF MEMBERS.

Honorary Members.—Mr. J. Bumpstead, Mr. Michael Brewer, Mr. George Clarke, Mr. Edward Clarke, Ebenezer Johnstone, Esq., Joseph Janson, Esq.,

Miss H. Martineau, Edward Moxhay, Esq., Charles Palmer, Esq., Mr. George Paul, Frederick Toulmin, Esq., Miss E. Wright.

Mr. W. Adamson, sen., Mr. J. Adamson, Mr. W. Adamson, jun., Mr. J. Argent, Mr. J. Allen, Mr. T. Blair, Mr. — Bowden, Mr. G. H. Bunney, Mr. C. Broadbridge, Mr. T. W. Buckham, Mr. Brooks, Mr. H. Caulier, jun., Mr. J. Curry, Mr. J. Cleverly, Mr. J. Clark, *Tottenham*, Mr. J. Clark, *Seven Sisters, Tottenham*, Mr. J. Clark, *West Green*, Mr. J. Coleman, Mr. G. Carey, Mr. M. Coston, Mr. A. Dodswell, Mr. W. Darling, Mr. E. Decker, Mr. J. Evans, Mr. F. Fraser, Mr. R. D. Fulloon, Mr. T. Gillan, Mr. S. Garland, Mr. E. A. Hutton, Mr. J. Hayward, Mr. T. Heseltine, Mr. D. Herbert, Mr. H. Low, Mr. T. Love, Mr. G. S. Masters, Mr. N. Merrett, Mr. J. Mackey, Mr. I. Odell, Mr. G. Press, Mr. T. Press, Mr. A. Protheroe, Mr. F. Purssord, Mr. J. Rodgers, Mr. T. Rodgers, Mr. J. Reeve, Mr. S. Sheppard, Mr. J. Strachan, Mr. W. Sherrington, Mr. J. Sherrington, Mr. T. Seear, Mr. A. Simons, Mr. J. Scrivener, Mr. J. B. Shaw, Mr. C. Tait, Mr. S. Tipping, Mr. D. Wilson, Mr. W. Watts, Mr. J. Welsh, Mr. W. Wilson, Mr. C. Wharton, Mr. J. Woodhouse, Mr. C. Wortley, Mr. J. Wallace, Mr. W. Walton.

Trustees. — Mr. William Adamson, sen., Mr. Ambrose Doswell, Mr. Hugh Low.

Treasurer, Mr. George Press.

Honorary Secretary, Mr. Edward Andrew Hutton.

Librarian, Mr. George S. Masters.

DEATH OF MR. RICHARD CUNNINGHAM, THE COLONIAL BOTANIST AT SIDNEY.

WE extract from the *Gardeners' Magazine* the following distressing account and confirmation of this melancholy event :—

"The deceased, it seems, accompanied an expedition into the interior of the colony, and when far distant from any European settlement strayed away from the party, no doubt in quest of the peculiar objects of his duty as a botanist, and was lost in the bush. It was conjectured that he might have fallen in with a party of the natives, with whom he might sojourn until he had an opportunity of regaining some of the nearest settlements, or until he was found again by the party he had left ; but no account being heard of him for a considerable time, the government thought proper to send a party of police in search of the poor wanderer. They arrived at the place where he was last seen, and from thence proceeded in a north-west direction, accompanied by one man of the first party and a friendly native. On the third day of their advance they fortunately met with two blacks (natives), who knew all the particulars of a white man having been murdered on the river Bogan, and also the names and persons of the perpetrators of the deed ; and as they offered to accompany the party to the country where the murderers were encamped with their tribe, the officer in command most

gladly accepted their services as guides; and on the evening of the fourth day after joining company, the party, by their directions, came upon a tribe consisting of upwards of forty men, women, and children, who were bivouacking on the banks of the lake fed by the Macquarie, and called the Budda. As no resistance was offered by the savages, they were made prisoners. A few questions produced an acknowledgment from them, that a white man had been killed by four of the tribe, three of whom they delivered up, and the fourth was absent on the Big river. On searching the bags of the tribe, the party found a knife, a glove, &c., which the three blacks acknowledged they had taken from the white man, and which were proved to have belonged to the deceased.

"The three murderers admitted that, about six moons before, they met a white man on the Bogan, who came up to them, and made signs that he was hungry; that they gave him food; and that he encamped with them that night. The white man repeatedly getting up during the night, excited their suspicion; and under the apprehension that he would betray them into the hands of enemies, they consulted together, and soon came to the determination to destroy him, which they effected the following morning, by one of them approaching him unperceived and striking him on the back of the head, and the others rushing upon him with their spears. This must have occurred about the latter end of April of the last year.

"The party afterwards proceeded to the place where the murder was committed, called Carindine, where the black man showed some bones, which he said were those of the white man they had killed, and pointed out a small portion of a coat, and also part of a Manilla hat. Being thus convinced they had reached the spot where the murder was committed, the officer and his little party, with true Christian feeling, collected all the remains they could discover; and having, in sad silence, deposited them in the ground, they raised a small mound over them, and barked some of the nearest trees, as the only means in their power of marking the spot whereon a man wholly devoted to science had, in the earnestness with which he was prosecuting botanical researches, been deprived of life by the hands of mistaken savages.

"Thus fell, in the prime of life, Richard Cunningham, an able botanist, and in other respects a very talented man, whose very amiable and obliging disposition had, in his life-time, secured to him as much general esteem, as his premature death has produced an universal sentiment of unfeigned grief, in the minds of all his friends in England, and of every colonist in New South Wales."

"We cannot tell" (says his surviving brother, from whose narrative

the above particulars are extracted)—“we cannot tell what might have been the state of his mind on that night, which had urged him repeatedly to rise in the dead stillness of midnight among his anxious sleepless companions, and thereby excite their suspicions. Could he have composed himself, he probably would have been recovered in a day or two by his companions, who came to the native encampment but a day or so too late! He had a mind well disciplined by the religious education he had received, and might have reconciled himself to a short stay in a remote desert, even among savages, until rescued by his party.

“I can add nothing farther,” continues his brother; “but, standing relatively as I do in this sad business, let me now for ever draw a veil upon the whole, just remarking, that two of the guilty natives found means to escape from the soldiers; and what has been done with the third, who was conveyed to Sidney, and there lodged in gaol, is not known; for it appears very doubtful whether any evidence could be obtained sufficient legally to substantiate his guilt.—A. CUNNINGHAM, *Kew, June 17, 1836.*”

We cannot help observing, that this is the third instance which has occurred within the space of two years; of the loss of three eminent and adventurous British collecting botanists;—the deaths of the first and last under circumstances of the most distressing nature, where there was no friendly arm to succour, nor friendly hand to close their eyes! Mr. Drummond, we believe, fell a victim to the insalubrity of the Mexican climate; so that all three may be said to have been martyrs in the cause of botany. Though departed from among us, and though their early deaths have deprived us of the hope of receiving what we expected from their intended labours, the plants which they introduced into our collections, and which bear their names, will ever remain as memorials of their exertions, and perpetuate their memories to the latest posterities.

A debt of gratitude is due from the living to the worthy dead. From the influence of this sentiment, it is now in contemplation to erect a monument to the honour of the lamented Douglas. This will appear from the following notice extracted from a printed paper handed to us by Mr. Loudon:—

“*To Gardeners, Botanists, and Amateurs.*—The Perthshire Royal Horticultural Society, desirous to express their sense of the advantages conferred on the science of botany by the late indefatigable Mr. David Douglas, through whose exertions a great and valuable addition has been made to the exotic *flora* and *arboretum* of Great Britain; in consideration of his successful exertions and lamented end, have resolved to erect a monument to his memory, in his native parish of

Scone, in Perthshire, and have appointed a committee of their number to carry the same into effect, by soliciting the aid of those who may approve of the undertaking. The committee have limited the sum to be subscribed by practical gardeners to from one to five shillings; any sum from amateurs, however small, will be thankfully acknowledged. The design of the monument will be regulated by the amount of subscriptions and approval of contributors. Every contributor to the amount of one shilling shall be entitled to a printed list of subscribers' names, to which a lithographic design of the monument and inscription shall be attached. Archibald Turnbull, Esq., Bellwood, Perth, has kindly accepted the office of treasurer; and a subscription-paper will lie at his seed-shop, Perth. Subscription-papers shall also be sent to the curators of the botanic gardens at Edinburgh and Glasgow, and to nursery and seedsmen in Edinburgh, Glasgow, Stirling, and Dundee.—*Nov. 23, 1835.*"

Mr. Loudon has most honourably and earnestly taken up this affair; and has had the day on which the subscription was *to close*, put off to an indefinite period, in order to give the friends of Mr. Douglas, and the admirers of botany in distant parts, "the melancholy satisfaction of testifying their sense of the eminent services rendered to botany and gardening by Mr. D.," by enrolling their names as subscribers to his monument.

Since the project has been entertained, the ideas of those most friendly to it have been greatly extended. The first idea, perhaps, was only that of erecting a piece of ornamental masonry, bearing an appropriate inscription, on some well-frequented spot in the deceased's native parish; but it has been asked, "Why not purchase as much ground around the monument as will contain all the plants discovered and introduced by Mr. Douglas?" This would be very appropriate in a public botanic garden, more especially in the one with which he was so intimately connected; but we do not see how this could be so well done in a rural parish, where funds would be required not only to buy, (or lease,) and fence, and plant the ground, but to defray the *annual expense* of keeping it up. But again—this difficulty is got rid of by another question, "Why not purchase as much ground as may suffice for a small market-garden, or nursery, and present it to the family of Mr. Douglas and his heirs for ever?"

Mr. Loudon is delighted with this suggestion, and envies his friend who has the honour of suggesting it. Mr. L. considers it the highest compliment that can be paid to the memory of a man by his country; compares it with the magnificent gift of Blenheim to the Duke of Marlborough in the reign of Queen Anne; and believes that if time be

allowed to collect subscriptions, the amount would ultimately enable the committee to accomplish this desirable object.

Mr. L. further announces that subscriptions will be received by Messrs. Longman, Rees, and Co. ; Mr. Charlwood, seedsman, Covent Garden ; Horticultural Society, Regent Street ; and he ventures to say, by all other Horticultural Societies, not only in Britain, but on the continent, in North America, and, in short, in every country where the character and fate of D. Douglas has been spoken of.

We beg to recommend the fulfilment of this tribute of respect to Mr. D. to our readers : their names on the list of contributors will evince the esteem in which the deceased was held by his brethren.

CALENDARIAL MEMORANDA FOR AUGUST.

KITCHEN GARDEN.—Sow cauliflower twice, viz. on the 21st, and again on the 28th ; spinach twice ; cabbage, of sorts, in the first week ; endive, the last sowing ; onions, to stand the winter, in the first week ; carrots, a small piece, on a warm border ; lettuce, of sorts, twice, and where the plants may be protected ; turnips twice ; parsley in beds, or as edgings ; radish, of sorts, and small salad herbs, twice.

Transplant cabbage, coleworts, borecole, and all other winter and spring greens ; broccoli, succession crops of, as directed last month ; also endive and lettuce on dry situations, and where they may be covered when necessary ; celery into shallow trenches.

The general business in this department is, preparing dung for mushroom-beds ; gathering crops, as onions, &c. ; clearing and earthing-up all rowed crops, as broccoli, celery, &c. ; blanching endive ; guarding seed-beds from birds, slugs, &c. ; clipping box-edgings and thorn-hedges, &c.

FRUIT GARDEN.—Regulating the growth of trees on walls, espaliers, &c., is still necessary. Gather and preserve the ripe and ripening fruit. Make new plantations of strawberries, and pot the necessary quantity for forcing. Melons in frames, and cucumbers on ridges or in the open ground, require pruning to increase the size or number of fruit : the vines of the latter should not be blown about by the wind.

FLOWER GARDEN.—Take up bulbs which have died down, and plant those intended to flower in autumn. Sow auricula and polyanthus seed ; bud roses ; prune calceolarias ; transplant heartsease to flower late ; propagate by cuttings, divisions of the root, or slips of all

such flowering plants as may be increased by such means; house camellias intended to flower early; sow mignonette in pots and boxes to blow in winter; prop chrysanthemums, dahlias, and all other lofty-growing plants; lay and take care of carnations and other stage-flowers; sow biennials, &c. &c.

REMARKS ON THE WEATHER.

DURING this month we have experienced many extreme changes of weather: it came in dry and very warm; but soon the sky became clouded, and heavy storms of thunder and lightning ensued, doing much damage to windows and garden-frames in some places, from the unusual bulk of the hailstones, and the force with which they descended. These storms were succeeded by a ten-days' course of dry weather; but on the 15th (St. Swithin) a showery season set in, which still continues.

This is a providential change, as many garden-crops were suffering, and the summer-planted ones needed a thorough soaking. Celery, broccoli, potatoes, kidney-beans, &c., will all be much benefited, besides preparing the ground for whatever may be sown or planted next month. All field-crops will be also benefited, except wheat, which needs no moisture at this time; for if wet and cold nights were now to happen, it would be in jeopardy of blight—that is, mildew, or what, from its colour, is called rust (*Puccinia graminis*). This, or more probably an *Æcidia*, is very plentiful on some sorts of rose-trees this summer, making the leaves appear as if sprinkled with brown powder. A timely application of soap-suds and sulphur would have prevented this attack. The insects, whose minute caterpillars live on the *parenchyma* of leaves of various trees between the upper and under cuticle, are, it seems, unusually numerous this season. In one garden, a whole wall of pear-trees has been seized; every leaf is tarnished, so that the gardener fears he will lose his trees entirely. Such an attack may, indeed, check the growth, but it will not be fatal, as the insects will shortly appear on the outside of the leaves, when they may be washed off and dispersed.

July 25th, 1836.

PAXTON'S
HORTICULTURAL REGISTER,
SEPTEMBER, 1836.

HORTICULTURE.

ON THE VIGOROUS GROWTH OF FOREIGN SEEDS.

It has long been observed by cultivators of both field and garden crops, that if seed can be obtained from any distant country, or from a soil very different from that on which it is to be sown, the seedlings rise more strongly, and the plants continue to progress with more celerity, than home-grown seeds or plants.

We have many instances of this :—potatoes brought from a distant quarter invariably succeed better than home-grown sets. Dutch and other foreign bulbs grow and flower more vigorously the first year after they are imported than they do afterward, and much more strongly than native bulbs, though the latter be of greater size. Farmers have long been acquainted with the advantage of changing their different seeds from high to low lands, and the contrary, and from poorer to richer lands, and the reverse. These are local changes, and are found to be advantageous, but on a different principle from the old and usual custom of not sowing the same kind of crop two years successively on the same spot. The latter is called good management, because it has long been supposed that each different species of plant requires the same kind of food, and therefore the second crop would be robbed of great part of its food by the first. Certain it is, that the same kind of crop produced consecutively upon the same ground, is diminished in bulk every following year, if manure be also withheld, but would not be so much the case if crops of different kinds succeeded each other rotatively.

Whether each kind of crop selects its own kind of food, and which is

said to account for the results above alluded to, is become questionable ; a new theory has been advanced to account for the fact, that plants "*get tired*" of growing on the same spot. The author of "*The Domestic Gardener's Manual*," and a chemical philosopher in France, M. Macaire, ascertained, about the same time, that plants exude a deleterious refuse or excrement from their roots, which is offensive to all other plants of the same genus. The authors of this idea have reason on their side, inasmuch as the water or earth in which a plant has been nourished contains, after the plant is removed, some fæcal matter belonging to the prepossessing crop ; but as to how much, or in what way, the discharges from the preceding are noxious to the succeeding crop, has not yet been fully explained ; nor has it yet been fairly proved whether the exhausting operation of the former crop, or its noxious exudations, be the discouraging circumstances to the following ; but we would say to cultivators, that it is either the one or the other—perhaps both ; and therefore it is well to keep to the axioms relative to a change of seed which experience has established.

It really appears that plants, like animals, are not only benefited by a change of soil, but by a change of air. If an old stunted pear or apple tree, which has stood in an old garden for years without increasing in bulk or showing any signs of healthy expansion, be removed to a fresh station out of the garden, or to a place a mile or two distant, it is immediately renovated, and thrives exceedingly. This and many other similar instances which might be quoted, show clearly that fresh soil and a new place have some unaccountable effect upon the dormant energy of such a plant. We know that in the act of removal many of the old and stunted roots are broken and dismembered ; and from the wounded parts fresh and more numerous roots will be produced, which, together with perhaps a little pruning of the head, generate a new vigour, which can only be attributed to the development of the new members. The soil of the new may be exactly like that of the old station ; and the quality of the air at a few yards, or even a few miles distant, cannot be supposed to be so different as so sensibly to affect plants exposed to it : we must therefore conclude, that it is not to the change of air, but to the disturbance and manipulation sustained by the plant in its removal, that we must attribute its reinvigoration.

As this greater vigour presented by foreign seeds or plants is so constantly an occurring circumstance, it behoves us not to be deceived by it, as in certain cases we may be. The planter who has heard of a certain new variety of potato raised in some distant place, immediately sends for a sack of the new sort ; they turn out wonderfully prolific the first and perhaps the second year. He cries them up to the skies ; but in the following years the kind begins to fall off in estimation, and is

very soon discarded for some other sort. The same thing happens in cultivating the different varieties of wheat and other cereal crops; on their first introduction to any locality they are profitable for a few years only, but in every succeeding year become weaker and weaker: some varieties, however, are more permanent than others.

Nurserymen who obtain tree-seeds, whether of old or new species, from abroad, find their advantage in this, both in obtaining stronger seedlings and greater credit from their customers who plant them; and from the same cause, when a nurseryman imports a new species of a forest tree, he is very apt, from the vigorous appearance of the seedlings, to give the tree a higher character than it deserves.

Agricultural seeds, such as the different sorts of clover, &c., are chiefly imported from the continent, and cost the British and Irish farmers annually a large sum of money; but this they had better submit to pay, than sow their own saved seed; at the same time, it would be a double benefit to the agriculturists were the duty on these seeds taken off or reduced.

To the Editor of the Horticultural Register.

ON THE SHANKING OF GRAPES.

SIR,—In your last number there is a letter from Mr. W. Denyer on the "Shanking of Grapes." I see that, with most others, he confounds the two diseases of shrivelling and shanking, which I feel persuaded are two distinct things. Mr. D., I see, inclines much to the opinion, that this disease proceeds from weakness; he must excuse me when I say I believe in ninety-nine cases out of every hundred it does not, if at all. Weakness will produce withering, but not shanking, if the house be dry. If vines are allowed to bear more than they have strength to bring to perfection, of course withering will be the consequence; but shanking is a different thing. If a house be perfectly dry, I believe shanking cannot take place. Mr. D. states, "When there is the least appearance of the disease, great attention should be paid to giving a good and regular supply of air, as the closer a house is kept, the more will the disease increase:" there can be no doubt of this in a house at all inclined to damp, for, do what you will, it will increase. This I consider only tends to prove my former arguments. Mr. D. asks those who are of this opinion, "Why the disease only makes its appearance when the grapes are changing colour?" This I feel surprised at. I must here beg leave to say, in opposition to his opinion, that there is every reason why it should take place at this period, being a very critical one with the grape, and one in which the fruit is not able to bear the noisome atmosphere created by damp. I was last year in

several houses where the vines were in excellent condition, and the borders very good, where the shanking made terrible havoc, in spite of all the gardeners could do; I should say, from the strength of the vines, they were able to bear double the crop they had on them. I examined the houses, and was more than ever convinced the disease proceeded from what I have before stated. I will pledge my word, that with proper management, in a *perfectly dry* house, Mr. D. never saw shanking. That he may have seen withering, I have no doubt. His concluding remarks are excellent, and I hope will be more attended to in future: but if a gardener be troubled with a damp house, I feel assured, even if he attends in every iota to Mr. D.'s advice, he will still be troubled with shanking.

Shanking in grapes is, in my opinion, want of action, produced by debility from over-heated, damp atmosphere, and takes effect on the extremities first, from their being farthest from the organs of nutrition. The human being would be acted upon in a similar way by remaining too long in a vapour bath.

G. T. DALE, *Manchester,*
(*Late of Wirksworth, Derbyshire.*)

July 10th, 1836.

VARIOUS REMARKS ON THE GROWTH OF PLANTS.

By the laws of nature, some plants are so constituted as to grow erect, others horizontally along the surface of the ground, and some again, having weak or laxive stems, either involve other bodies for support, or are furnished with prehensile members or tendrils, by which they climb and support themselves on other plants or bodies. In cultivating these different descriptions of plants, we generally take lessons from nature; we give poles to the hop, rods to the runner kidney-bean, sticks to peas, and treillage to the grape-vine. But some plants in cultivation are, by reason of their tropical origin and constitutional tenderness, unfit to bear the open air in this country, and therefore must be kept in close-glazed frames, and, notwithstanding they are climbing plants, no supporting props can be afforded; so that such imprisoned plants are compelled to be creepers instead of climbers.

It will readily occur to every reader that the melon and cucumber are alluded to; and though these plants have been occasionally trained in houses as nature intends they should grow, it is but lately that it has been noticed and proved by one of the first horticulturists in the kingdom, that this position of the plant seems absolutely necessary for increasing the size of the fruit.

There are many instances of the swelling membrane of plants increasing much faster *downwards* than in any other direction. A wounded stem or branch of an exogenous tree is healed quicker by the living membrane descending from the upper than it does from the lower side. If a wound be made on the stem of an herbaceous plant, as is performed in layering, the point of the dissevered part, called "the tongue," usually swells more than the other parts. The same kind of protuberance is often seen at the lower points of both grafts and inserted buds, and we may add cuttings also. When the new method of inarching is performed—that is, by separating the graft entirely from the mother plant, and attaching it by its middle to the stock, and placing the lower end of the graft in a phial of water made fast thereto—the bottom so immersed very soon swells, and emits roots in the same way as a cutting placed in the ground.

Now it would appear that all such instances of the protrusion downwards of the actively increasing membrane of trees and shrubs, the downward lengthening of the cucumber, &c., are accomplished by something like gravitation, were it not that practical experiments carefully performed show us that in these processes gravitation is *not* an agent. If the stem of a young tree in a pot be encircled by a tight ligature, or have a ring of bark taken off all round the same, and the plant and pot be reversed upon a lofty stage-top downwards—the root being duly supplied with water—the plant will grow, its shoots of the head turning upward, and the stem will swell unequally; the part above the band or incision—that is, the side nearest the hanging head of the plant—will be largest, and in the same way as if the plant and pot had been set upright. This experiment shows decidedly that it is not from any *sinking of the sap* that young roots—the living membrane—or other downward processes of a plant, progress with more celerity than the same do in any other direction.

We have other instances of the unequal growth of vegetable membrane exemplified in the following particulars:—the most shaded side of the stem of a tree, and the lower side of the horizontal branches, are always farther extended from the pith, or centre, than the sunny side: if a tuber—a potato, for instance—be partly above ground, the exposed side swells much slower than the buried portion.

We have already alluded to the circumstance of a wound on the stem of a tree being healed sooner by a new bark and wood which descends, than by the same which approaches from the bottom or sides of a scar. It was once a part of our duty to attend to the healing of a wound on the stem of a favourite tree, which required a period of eighteen years before a complete cure was effected. A very fine specimen of the

Platanus occidentalis stood in a pleasure-ground, being much valued as an ornament, and particularly because it served to hide during summer a murky mass of spruce firs. The bole of this tree was divided, about four feet from the ground, into two nearly equal parts, and formed together a finely-balanced head. In a violent gale of wind the outer half of the tree was split off, leaving a scar four feet in length, and nearly as wide as the diameter of the remaining trunk, viz. eighteen inches. Forsyth's plaster was then in high repute; the wound was first prepared by smoothing off the rough edges of the bark and splinters of the wood with chisels and planes, and a good plaster made, *secundum artem*, and applied, and renewed from time to time for many years. Whether this once famous plaster did any other good than keep the bare timber dry, we will not assert; but we are quite certain that first smoothing and then covering the wound with a good coat of tar, with a little tallow and saltpetre added, and renewed if exhaled away, would have been a far better application, as well for preventing the decay of the naked timber, as for offending insects, which the plaster did not do, and healing the wound.

During the summer of the next year after the accident, the new growth of bark and wood began to protrude from beneath the edges of the old bark all round the wound, and every summer continued so to do; the new growth always proceeding from underneath the lip of the former year's growth, the bark of each year's growth being annually raised up and left behind. The new advancing lip was first whitish and very succulent, then green, and afterward brown and woody. It advanced, as has already been noticed, with different degrees of celerity; that at the bottom of the scar slowest, from the upper edge fastest, and from each side moderately. It was quite evident, however, that the drying effects of the sun and air upon the succulent lip of the collapsing member was in proportion to its exposure. The wound was on the south side of the trunk; and the sun's rays striking so directly upon the lower lip, indurated, and consequently checked its expansion much more than the others, especially the upper one, which was not shone upon at all.

So much were we convinced of the hardening effects of the sun's heat and impact of air upon the protruding cambium, that it was doubtful whether bark was an identical member, or only a condensed surface, (like the crust of bread,) formed by the indurating action of the air. But this idea could not be maintained, knowing as we did that a new bark, called *liber*, is every year formed entirely out of the reach of the air; but finding that the new member progressed faster in darkness than in light, we concluded that the thicker

any topical application was, the sooner a wound would be healed thereby.

The tendency of the vital membrane, or roots, towards darkness or any solid opaque body, is amusingly exemplified by the roots of orchideous plants suspended in a damp stove; for though they may be produced towards the lightest side of the house, they soon trend round, and lengthen towards the back wall. A very expert cultivator of this tribe of plants, attributed the flexure of the roots to the attraction of the solid brick-work, and not to their inclination for either greater damp or darkness, nor yet to their aversion to light. The inclination or flexure of the stems and roots of plants seem to be opposed to each other, as if actuated by a contrary polarity. While the latter retire from, the former seek and turn to, the light. These movements are curious, and not easily accounted for. Every one is aware of how instinctively all plants present their growing surfaces to the strongest light. If healthy plants be placed in a dark room, and a single ray of light be admitted at the smallest aperture, soon all the points of the shoots and discs of the leaves are turned towards the stream of light. This is a proof that the plants are affected in some way by light, and either by attraction or irritation.

Professor Rennie, we believe in one of his scientific alphabets, accounts for this phenomenon by comparing it with the contraction of damp paper when held before a fire, or to the flexure of a board laid on moist ground. In both cases the moistest side swells, or rather remains swollen, and consequently occupies more space than the dried side, which is contracted. The effects in these cases are quite natural, and easily understood; but whether applicable to the somewhat similar motions of plants, is not so evident, unless we could suppose that there is also a current of *drying air* ejected along with the light. But this we cannot readily conceive, when we look at the shoot of a potato at the further end of a dark vault (where no current of dry air can reach), presenting its top and leaves to the faint glimmer of light from the key-hole of the vault-door. In such a confined place as this, and where there can be little or no circulation of air, and very little difference in the state of the air as to humidity, we are led to conjecture that light has some peculiar effect upon plants, independent entirely of moisture.

The tendencies of roots towards their aqueous or gaseous food may be accounted for by supposing that an imperceptible vapour and effluvia are ever escaping from the sources, and these attracting the extreme spongioles, lead them onward to their food. As the roots, as well as the other growing members of a plant, are merely passive organs, they can

only be affected by external agents inciting them to action. The universal law of attraction is productive of results and combinations which, from the imperceptible processes in which they take place, are always more or less obscure. Currents of fluids are generated between evolving and receptive bodies, which gain for the latter a character of self-action and inherent power which, in the case of plants, it is impossible they can either possess or deserve.

In speaking or writing of vegetable development, therefore, it cannot be correct to assert that the roots *can* turn to the right or to the left; that the sap *can* ascend or descend; or that the shoots *can* lengthen themselves or remain stationary, as if they were endowed with a kind of volition like animals. The fact is, the causes of these movements and developments among vegetables are *without*, not *within*, the respective systems. The exciting causes are external, and the susceptibility of excitement is internal. Fermentative or elastic fluids, in expansible membranes, obey the stimulants of heat, air, and light, and conjointly exhibit all the phenomena of vegetation.

ON THE SHANKING OF GRAPES.

I AM glad to see so many opinions upon this disease appear in your Register; the point wants elucidation very much; and the gardener cannot be too observant, if he wishes to discover the origin of the complaint.

I am sanguine enough to think, that what I am about to observe will throw a little light upon the subject.

In page one of the March number (Vol. V.) is a communication from a Mr. Dale. He adopts the opinion of those who consider the disease to be caused by an *over-moist*, heated atmosphere (the excess of vapour being condensed, the water settles upon the footstalks of the bunches, which the sun acts upon as on a lens, and causes a scald upon the footstalk as much as hot-water would); hence the necessity of giving air by the top sashes early in the morning. Some practitioners have recommended keeping the house shut till all moisture arising either from sprinkling the evening before, or from the condensed vapour created by the morning sun, has *disappeared*. Air must be admitted some time, if there be any prospect of sunshine; and the earlier, the more natural. I have seen much damage done to grapes in a pine-stove by neglecting to give air when the foliage and fruit were wet with previous syringing; and undoubtedly this is *one* exciting cause; the leaving too large a crop is another: but the chief agent, as

I hope to prove, is the deficiency of roots, arising from the vine growing in too heavy and cold a soil. This tree is so ready a rooter, that nothing but a bad or really defective medium will prevent it from extending its roots far and wide in a short period. In very poor sand, with a little turf mixed with it, I have seen a vine push surprising roots: so in a soil of an open nature, with abundance of large flints, brick-bats, whole bones, &c., intermixed, the vine will grow luxuriantly; its roots will throw out innumerable fibres. I witnessed this in opening a walk which ran in front of a vinery; it had been made with large stones at the bottom, and the roots—the fibrous roots I mean—had nearly forsaken the border, which was of a cold, ungenial nature, and had betaken themselves to the walk, which they evidently liked much better. This is an important fact, for it clearly shows the sort of materials which ought to be employed in making a border, not only for the vine, but for almost all fruit-trees.

Gardeners are aware of the good effect produced on plants growing in pots by keeping the soil open, and even lumpy, particularly if the mould be of a heavy, loamy nature; for otherwise, by constant watering, it will become sodden—a state in which nothing can thrive, for the roots decay, or are so disabled as to be unequal to the task of duly supplying the waste produced by the leaves, &c.

I have seen vines in pots grown on a very extensive scale; and I intend to make some observations upon some plants which were forced in the winter of 1833, with the hope of obtaining a few bunches early the following spring.

The vines being in good condition for bearing, were placed in a pine-stove in the month of November; they all, or nearly all, showed fruit, and four to nine bunches were retained on each. The plants grew well, and made excellent wood; but many did not set their blossom well; but as they continued to look healthy, the defect was attributed to the sorts. Setting aside this, the vines did well; the bunches and berries attained a good size. As the pots were small, constant attention to watering was very necessary to prevent flagging; but this frequent application of water upon a naturally too strong loam, caused soddening of the whole ball about the period of the last swelling of the fruit. As the bright gleams of spring came on, the plants showed their exhausted state by flagging, though the mould in the pots was quite moist: scarcely a day passed without the foliage being scorched; indeed the injury was so extensive, that not a leaf remained entire. The fruit was so imperfect, that not a bunch was fit to go to table; most of the bunches had shanked more or less, and required curtailing as far as the disease extended.

As a proof that the fault was in the *root*, some of the plants were shaken out of the pots, when nearly half the mould at the bottom was found destitute of roots, and so adhesive, that it required to be scraped out.

This circumstance, which came immediately under my observation, is, I think, conclusive as far as pots are concerned, and it is reasonable to suppose will apply equally to an unprepared border.

The imprudent application of fire-heat, which Mr. Knight many years ago wrote upon, and "*Scientiæ et Justitiæ Amator*" so ably followed up in a paper (in the tenth volume of the *Gardeners' Magazine*) *practically* elucidating the propriety and advantage of following a more natural plan, should by all means be read by every person who has early forcing to attend to; more especially when I assure the readers of your Register, that the author of the paper referred to, who now lives as gardener to a gentleman but a little distance from London, practises closely what he there wrote, and with the best results. I called to see him early in June, and in a vinery then ripening its fruit saw the most perfect bunches of the White Frontignac, such as I had never before seen—indeed they were perfect; not to mention Hamburgs, which were large both in bunch and in berry, particularly the latter. It is but *too* seldom that we find a man acting as he writes or talks; when we do, it is a very great pleasure. One great reason that crops so often fail, is the constant heat kept up night and day; in consequence of which the vigour of the vine becomes exhausted.

I wish very much that Mr. Stafford would once more come forward; and give the gardening world his opinion on the cause, or causes, of the "shanking of grapes." I never remember to have seen his fruit suffering under the disease—at the same time, his crops were great. Now if this, as has been advanced by some writers, were a principal cause, why are not the bunches affected that are growing on his vines in pots? In the month of May, 1834, I counted as many as thirty-six upon one vine of White Muscadine, growing in such a pot as he has given the dimensions of in the first volume of the Register: the grapes were perfectly ripe at the time, and excellent in flavour.

A. L. A. T.

LANDSCAPE GARDENING.

LETTER FIFTEEN.

DEAR SIR,—As we proceeded over the park of ——— Court, we met with a much greater variety of scenery than on our first entrance we were led to expect. At a considerable distance beyond the mansion, and in the direction in which we were riding, we came suddenly to the top of a valley which opened to the eastward, admitting at its mouth a noble bend of the river S——. The brows of the valley are clothed with magnificent oaks, like the rest of the park; and the open expanse of turf between keeps up those ideas of ample grandeur which is the principal characteristic of the place.

We rode down the centre of the valley to the bank of the river, which is palisaded, and forms the boundary of the park on that side. Within the palisade there is a raised terrace, from which there is a fine view of the country beyond the river. The latter is very much widened in this place by a branch of it flowing round a considerable islet in the middle, forming a secure resort for aquatic birds, particularly the herons, which are seen wading round the shallow margins, and, whether on the wing or seeking their food, are highly ornamental.

Scenes of still life, however beautiful or picturesque, receive additional interest by animated figures, of whatever kind they may be. Herds and flocks of domesticated animals enliven every open space, which would otherwise be insipid; and when wild ones are intermixed, or cross our path, or are seen winging their way over head, or heard sweetly carolling in the woods and brakes, yield increased amusement and pleasure to the lover of nature.

The value of garden scenery is greatly enhanced by the presence of the objects of the ornithologist, and even those of the ichthyologist. Aviaries and piscatories, wherever they can be introduced, may very properly be associated with flowers; and when beautiful fish may be taught to feed from the hand like birds, it is a pleasant exercise to the benevolent mind to possess and make happy such captives; even from the terrace whence we were surveying the expanse of water, the frequent rising of the trout was enviously amusing.

On the brink of the river, and under a grove of evergreen trees and weeping willows, we approached a very elegant and, from its interior arrangement, commodious bathing-house, containing baths for either cold or tepid filtered water, with comfortable dressing-rooms, &c. &c. The exterior is a modern stone building, somewhat in the Italian style,

having a central dome with side wings, and servants' apartments behind. The front entrance next the river is under a pediment supported by handsome columns, and approached by flights of steps on each side. The water is pumped into elevated cisterns for supplying the baths, &c.; and the whole is designed with great taste, and includes every convenience required in such a necessary building.

Although a beautiful object in itself, and marking the affluence of the proprietor, it is certainly at too great a distance from the mansion-house to be conveniently used. On my remarking on this circumstance, his Lordship was pleased to explain how it happened to be placed where it was. A former dowager lady of the estate fixed on a station in the wood, on the higher ground above the baths, to build herself a villa, (which we were then approaching by a rising road,) and as an appendage she also built the baths for her own use. On her death, the villa became a residence for the land-steward, which it still continues to be, and the baths are kept up as a memorial of the deceased.

The steward's house is a handsome structure, built and fitted up in the cottage style, containing several large and airy rooms, two of which are kept for the use of his Lordship and friends, to take coffee or chocolate when out riding or driving in that quarter. The windows command a fine extensive view of the valley of the river; and though but little of the park is seen, except through two narrow vistas, yet the situation is well chosen for a summer residence; and it has a dressy appearance in consequence of some of the more choice sorts of exotic forest trees, planted by the Dowager Countess, having become intermixed in the surrounding wood.

Proceeding from thence through wood of various character and aspect, we arrived on a rather elevated plain, on which was plainly discernible the traces of what had been once an entrenched camp, but whether Roman or British, is unknown; but certainly of very ancient date, as some of the largest and apparently oldest oak trees grow on the crest of the mound, as well as in the ditch. A little further, and on a knoll in view of the house, is erected a lofty stone obelisk on a square pedestal, inscribed to the memory of the Hon. Colonel J. R——, who fell at the head of his regiment in storming the citadel of ———, in Germany. Such monuments are suitable ornaments for a park, and more especially when intended to immortalise the truly honourable, the worthy, or the brave. However interesting either natural or artificial scenery may be, it is always enhanced by objects which elicit new ideas, recal pleasing recollections, or incite new trains of thought or of conversation, which may be mutually instructive or entertaining.

Italian gardens were crowded with objects of this kind ; statué, historical vases, commemorative urns and cenotaphs, costly fountains with their Naiads, and alcoves, were placed at the end, or at every turn of a walk, in every recess of a wood, or at every angle of a parterre. These ornaments, if well executed, so as to be admirable as specimens of art, were agreeable and suitable accompaniments to the richer kinds of evergreens, as orange and myrtle trees, and to the softer forms of cypress and cedar. Some of these objects were very appropriate ; but before the fashion fell into disrepute, many most ridiculous things were executed, and many ludicrous figures or characters represented by the statuary or the founder. A drunken beastly figure of Bacchus, or one of his votaries, vomiting water into a marble basin, was no very refined spectacle to behold ; nor were naked figures of some of the deities of the heathen mythology fitting objects in countries often covered with snow, where the imaginations of the inhabitants were cooled down and subdued by a more rigid sense of decorum.

Notwithstanding Italian gardening, with its molten or sculptured ornaments, has been long banished from this country, it is questionable, perhaps, whether we have not gone too far in this work of sweeping extirpation. There is, certainly, a description of sculptured or architectural ornaments, like the one we have just passed, which is admissible and particularly appropriate in park and garden scenery. A place like a garden, confessedly dedicated to pleasure, and for the gratification of the eye, where so many elegant forms and colours are combined, is surely receptive of accessories which would enhance the value of every vegetable form, of every hue, and of all its various fragrance ; even the solitary sun-dial in the middle of a grass-plat or gravel-walk, is not only an ornament, but a silent monitor.

This seems to have been the conviction of the able and talented designers of Stowe, Paine's Hill, and some other celebrated places. In the former of these places, architectural and sculptured edifices have been lavishly bestowed ; it is a perfect museum, in which botanical, historical, and much biographical information may be acquired, while enjoying views of the richest dispositions of land, wood, and water.

At Stowe, such ornaments are perhaps in excess, though quite in consonance with the style and splendour of its princely palace and surrounding domain.

It is but seldom that the style of Stowe can be imitated, but the principle is applicable to the smallest garden ; and now that the most classical composition ornaments can be obtained, at a reasonable rate, it is to be expected that pleasure-grounds will once more be decorated with these beautiful specimens of art.

Proceeding onward over this spacious park, we passed the keeper's lodge, to which are attached numerous buildings and feeding-yards for deer. Here is also a large and well-constructed pheasantry, and other houses for poultry, kept and bred both for ornament and use; the roosting apartments for tropical birds being heated by fire-flues in winter.

The regular herd of deer is usually kept up to about twelve hundred head; venison is, therefore, a plentiful and almost constant treat at his Lordship's table, as well as at those of all his friends. The management of a herd of deer requires much attention on the part of the keeper and his assistants;—it is a branch of rural economy which is only known among the fraternity. Very meagre accounts only have hitherto been published concerning the management of this kind of stock.

When war and hunting were the principal occupations of the sanguinary kings and rude barons of the kingdom, whole uninhabited tracts of the country were set apart and appropriated to the chase; but as agriculture was extended, fencing became necessary for the protection of the crops; and as the sustenance of the whole community soon became dependent on the farmer's products, laws were enacted which gave the tenants a power to protect their crops from the trespassing game of even their landlords. To preserve the game, many of the more opulent barons resolved, lest their game should stray away to the haunts of the freebooters, to enclose their chaces with a high paling or wall; and hence the origin of parks. Erecting such extensive and costly fences in those days, was much more easily accomplished than such things could be at the present time. The numerous tenantry and retainers, all bound to do "suit and service" to the lord, were at the beck and call of the chief, and their united labours soon completed such works. These times and circumstances are fast passing away: many ancient parks are now corn-fields, and those which remain are kept up rather as an appendage of state and affluent ancestry, than for any other pleasure or profit they yield the possessor. The one which we have been surveying, and which has called forth the above remarks, is certainly one of long standing, and has certainly an air of graceful dignity, which is everywhere very impressive.

As usual, there is a large farming and dairying establishment, called "the Grange," belonging to — Court, for the supply of the household, stud, &c.; and the whole appears to be a perfect type of an ancient baronial residence.

Returning by the house, we visited, at the bottom of the court of offices, the riding-house and tennis-court, both lofty and noble build-

ings, though now but little used. Besides the riding-house, there is a shed carried round three sides of the extensive offices on the outside, supported by columns for equestrian exercise in wet weather.

After partaking of a slight repast, we took leave of his Lordship, and returned home in the evening.

I am, &c.,

A. B.

(*To be continued.*)

MISCELLANEOUS INTELLIGENCE.

REMINISCENCES OF A VOYAGE TO AND FROM CHINA (*continued from page 297.*)—During a fortnight's stay in Torbay, the ship was re-rigged under jury-masts, and prepared to proceed to the river Thames, but was towed the whole way by the *Assistance* fifty-gun ship.

When the wreck was cleared off our unfortunate charge, we could then perceive the amount of the damage sustained; all were more or less broken or displaced, and some were completely bruised to atoms. The shattered remains of the platform and boxes were removed, the loosened roots of the plants replaced, and all was as well secured as possible for the few days which yet remained of the voyage.

In sailing *up* the channel, we could not but reflect with what very different feelings we had passed *down* nearly two years before. When outward bound, all was joyous expectation and fervent hope; we anticipated success, fearing neither the perils of the sea nor any other disaster. Now we felt a sickening reverse; our intense anxiety, various labours, and patient watchings, were all to go without the expected credit, and, moreover, without the dearly-cherished reward of *self-gratulation*. As, however, we were accompanied by several officers who were also interested witnesses of all our proceedings, we felt certain that we could not be charged with negligence, nor want of ardour in the attempt. This was some consolation; but it fell far short of what we expected, seven months before, would have been our mental pride and satisfaction on our arrival in England.

At this time too, we well remember, our mind was extremely unsettled; we had been roving over a great portion of the surface of the globe for nearly two years; we had seen the inhabitants, and heard the news of many different countries lying very widely apart; and without feeling the least satiety of this change of scene, we felt as if happiness could not be found in any *one* spot of the earth; and we envied the

crews of the outward-bound ships that passed us, and which were proceeding to the extended theatre and scenes of action we had left for ever.

On doubling the South Foreland, we were desired to lay aside our sailing dress, and resume our *go-a-shore* habiliments. The press-gangs were then on the alert, and the officers knew that the crew would be mustered and *thinned* on our arrival at Gravesend. No sooner had we cast anchor, and the towing hawser of the *Assistance* thrown off, than the first lieutenant of that ship (our old friendly acquaintance!) came with a boat's crew, and selected the *elite* of our company; the Lieutenant (Brenton, if we remember rightly) thinking he had the best right to those able seamen whose skill and fearless actions he had often witnessed. This scene was distressing; for we saw many worthy men—quarter-masters and others—torn from the outstretched arms of their wives and friends on shore.

In the meantime an agent from Sir Joseph Banks, with an order of the Privy Council, came on board for the plants consigned to the care of that gentleman. They were instantly delivered, by leave of the Custom-house officer who had charge of the ship, and were, we believe, directly conveyed to Kew.

During this bustling scene we, by order, paraded the quarter-deck among the officers, having in charge Captain Burnyeat's chronometer as a protection, (for by the rules of the Hon. East India Company's service, we were rated as ordinary seamen on the ship's books,) which averted the prying eye of his Majesty's Lieutenant; and soon after we went on shore with the captain, and came post to London, bidding farewell to the ship and companions of our voyage for ever.

It is a fortunate pliability of the human mind that it can accommodate itself to whatever circumstances it chances to be placed in. On taking leave of our good friend, the Captain, at the door of Messrs. Borrodaile, in Fenchurch Street, we, without any well-defined object or distinct pursuit in view, took our way towards Mile End, to call on our old acquaintance and patron, Mr. A. Thomson. Here we met a hearty welcome, and were engaged the same night to take the charge of the plant-houses in that then celebrated establishment.

From Mr. Thomson we learned that, immediately after the death of Mr. Slater, the seat of Low Layton was given up, and had passed into other hands; Mrs. Slater and family having retired into the north of England, and all the old servants dispersed in all directions. We never visited the place afterwards.

We took an early opportunity of waiting upon the principal executor of our late employer, to inquire whether there was anything in our

favour in his agency. He answered, "No;" and added, that "unless we had a legal claim, which we could substantiate in a court of law, no attention could be paid to our application." We replied, that "the deceased was too generous and honourable a character, to render it necessary to bind him by any written agreement; so that nothing of the kind existed." He said, "Very well"—and so our adventure ended.

Before this interview, all our drawings, specimens, and seeds, had been delivered to the purser; but what became of them we never learnt. The executor also told us that the shattered remains of the plants had been disposed of to George Hibbert, Esq., of Clapham, at that time, and for many years after, a most ardent and munificent collector of plants.

We never gained correct information of either the number or the names of the plants which we introduced, or were the means of introducing, into England in 1794. Those on board of the other ships of the fleet, which looked so well at St. Helena, we had no means of knowing anything, or to whom they were presented; and it was only of a few that went to Clapham that we ever heard of, and that only occasionally and indirectly; for soon after our return to England we left London, and became located in a distant county, where a variety of new duties were imposed, very different indeed from the study of exotic plants or of their history.

It only remains for us to state what would have been our plan of proceeding in transporting Chinese plants, had it been our fate, as it was our wish, to have been sent a second time. And here, perhaps, we should pause, and acknowledge with gratitude what we personally owe to an overruling Providence, which, by a concatenation of events, prevented our sailing a second time in the *Triton*; for on her next voyage out that ship was taken, by stratagem, by a French privateer, and carried into the Mauritius; *Captain Burnyeat, several of his officers, and crew, being murdered in cold blood on the quarter-deck!* This would have been to us a far greater disappointment than the first, with loss of happiness, and probably with loss of life!

But to return to what may yet be of use to others who may be employed in transporting plants from China, or from countries in corresponding latitudes, we would advise that a stout grated frame of wood be erected over the space which can be best spared, which will be that immediately behind the skylight on the poop-deck of an Indianan, or any other similarly-built ship. The top of this grated cage should be in one panel, moveable at pleasure, to permit access to the plants

during the voyage ; thus they would be secure from monkeys, goats, or other animals on board. The oldest, stoutest portable plants should be chosen, and particularly those which have been for a year or two established in pots ; for we found that such bear the vicissitudes of the voyage better than young and recently-potted plants. As proof, we may allude to their dwarfed trees, which, when brought home, always arrive in good condition. Boxes should be employed ; but their sides and ends need not be above fourteen inches high, with strong handles for the convenience of hoisting them in and out of the ship. The pots should be plunged in moss, or in some other soft material retentive of moisture.

Throughout the voyage the plants should be kept rather dry than otherwise ; they may receive accidental showers, which are usually soon dried up again, but by no means kept so moist as to excite vigorous growth. Shading with thin canvass in the middle of the day, when the ship is near the equator, will be of more use than any other treatment that can be afforded.

Besides taking too much care of our collection, and treating the plants in the same way as if they had been in a British conservatory, we committed another error, and that was by our endeavour to bring so many. The stern balcony—certainly the best place in the ship—was chiefly taken up by the plants consigned to Sir J. Banks, and other things belonging to the captain ; and having, by our own choice, had so large a portion of the poop-deck given up to us, we could not think of encumbering the captain's private apartments with boxes or single plants, where, however, they would have been much more safely transported. This confession and opinion is confirmed by the success attending the introduction of one or only a few plants, in a box which may be placed in a spare quarter-gallery in the stern balcony, or other apartment, secure from changes of weather, or out of the way of the business of the ship. It is almost unnecessary to add, that sea-water, whether spray or from washing the decks, should never be allowed to fall upon either the leaves or roots.

The constitutional habit of plants renders them more or less capable of being safely transported. Bulbs and tubers require little or no care in conveying them from distant parts. Herbaceous or half-shrubby plants, with fleshy or thick fibrous roots, such as chrysanthemums, are easily brought over ; because, as their growth is a continued production of new shoots and new roots from the collet, the loss of either for a short time is seldom fatal : so all plants, trees, or shrubs that stole, are less liable to be destroyed by atmospheric changes than others which do not ; and the most difficult of all, perhaps, are those trees and shrubs

which have a large system of delicate, fibrous roots—so quickly perishable if once they get thoroughly dry.

The best season for shipping plants from China to Europe is the autumn, or as soon as their summer growth is over, because they would have a chance of passing the Straits of Sunda before their regular seasonal growth commenced; and if they were excited by the higher temperature of that region, they would be soon again in a cooler climate in doubling the Cape, which would tend to check rather than advance their growth; and they would be at St. Helena in their own spring, whence they might reach Europe in good condition.

Leaving China in spring, we consider the most inauspicious season, because their natural growth has already begun, and passing so rapidly into midsummer heat deranges the balance which should subsist between the roots and head; and hence the exhaustion and failure of the latter.

Having already mentioned the names of the plants we purchased at Canton, it is unnecessary to repeat them here; and though many additions of Chinese plants have been subsequently introduced by other collectors, we are of opinion that hundreds of fine plants are natives of that vast empire, which are yet to be discovered and added to our collections.

In looking over this account of our voyage and its results, we apprehend that rather too much egotism will be observed to prevail in it, though we have suppressed many personal adventures and observations which might have been, but not fairly, brought in. Though barren of instruction, it may afford a little information on subjects not quite foreign to the plan of the Register; and if amusement also, our motive for writing it is answered.

J. M.

MY DEAR SIR,—I have been so engaged lately, that it has been out of my power to pay a suitable attention to your interesting letter. Accept, however, at this late period, my sincere thanks for the manner in which you have acted in endeavouring to establish your own propositions, and controvert what you are pleased to term my “prepossessions.” That I should be destitute of a feeling which more or less is common to humanity, would indeed be a wonder; but I beg to assure you that you are not the individual whose sentiments I should be very likely to be prejudiced against. In common with many more, I have long regarded you as one of the best practical phytologists of the day; and may also mention, that some of your papers in the *Gardeners’ Magazine* first impressed me with the importance of studying the principles of vegetable development. However deficient, therefore, I may

be in the knowledge of these principles, I do not consider that, with strict propriety, you can set it down at once to my prepossessions, when I do not fully coincide with you ; especially after you had been told that my opinions were not fully formed, and that more information was my principal object. Besides, though I am fully convinced that such statements were made with the kindest possible intentions, you must, from your experience, be perfectly aware that such a method is the very easiest that could be adopted for silencing objections to any theory, while it renders, to a great extent, nugatory what an objector may farther advance, until he has satisfactorily freed himself from the imputation of prejudice—a result which, were it possible, would, from the very egotism it involves, be attended with circumstances anything but pleasing. You seem also to have acted upon the supposition, that, when I did not agree with your opinions, I held and maintained the reverse ; and hence you have been led to bestow more labour in demolishing the theories of others, than in establishing or elucidating your own. It is true, that in many respects I did, and do, approve of the leaf-elaborating, sap-circulating theory, though far from being fully satisfied with it ; and when I state that I see nothing more unphilosophical in believing that theory, than in giving credence to the one which you have propounded, you have no right to infer from this that I am bound neck and heels to this or that physiological creed, nor yet to consider that you have sufficiently gained your point, until you have shown clearly and indisputably, from facts and principles, in what (not the equality, but) the decided superiority of your theory consists.

As one proof that my prejudices are not remarkably deep-rooted, I am glad to have it in my power to inform you, that if no other advantage results from this discussion, it has had the influence of causing me to doubt some things which I had almost firmly believed ; but I feel sorry to add, that your reasoning, though well calculated to lead to fresh inquiry, has failed to convince me that your theory is the one which I should find free from objections. In answering my letter, too, you sometimes strain my observations from their obvious meaning, and make a distinction without a difference. Thus, you state that “ I have no doubt but that a purely homogeneous and elaborated sap may be changed into wood or bark,” &c. Now I merely stated that I did not perceive that supposing the one theory was more unphilosophical than supposing the other ; and I do conceive that, so far as my own individual opinion is concerned, I have a perfect right to hold the balance of investigation, until that scale preponderates in which the greatest weight of fact and argument is accumulated.

Again, you ask “ Can you or any one else bring forward indubitable

proofs that the sap regularly descends, or that it is organisable?" We know that "facts are stubborn things," and valuable acquisitions in every science, but unfortunately we can refer to few tantamount to indubitable proofs in the science of phytology. The operations of the vegetable kingdom are placed so much beyond the power of our research, that our knowledge of their primary principles of movement can only be known by the effects which we see produced; and these effects being frequently ascertained by mutilation upon the living plant, this of itself is a circumstance capable of rendering any proofs so obtained at best but dubitable. Many circumstances, however, some of which I formerly adverted to, render it extremely probable that there is a circulation of fluids; and I do not see it impossible, as I stated formerly, that the plant, by virtue of its vital principle, should possess the power of appropriating the elaborated sap to the expansion or formation of what it contained in embryo; but, as to indubitable proofs, I lay claim to the possession of none. Such a process is, no doubt, wonderful; but it is not a whit more incredible than many natural phenomena of a similar nature, which it would be madness to think of doubting—such as the formation of a seed from the action of the dust of an anther upon the moist summit of the germen, the production of a bird from an egg, or the means by which an animal derives its existence. But you believe in the partial and occasional sinkings of the sap, and I desired to know upon what principle you could account for these partial sinkings. These questions of yours, though sufficiently interesting, are no answer to mine. Putting a question to me which I am unable to answer, is no satisfactory explanation or confirmation of one of your own propositions; it only leads me, imitating your example, to demand the proofs you possess for establishing what you may term "*the true philosophy*" that there is in vegetables—the strange anomaly, that while all around in creation is regulated by systems of perfect order and design, their operations alone should be accomplished partially—occasionally, in fact, fortuitously.

Again, you state "my mind would be steeled proof against the reception of a contrary doctrine, so long as I believed that the sap is elaborated *in*, instead of *by*, the leaves." You place the words *in* and *by* conspicuously in *italics*; but I have yet to learn the force of the distinction, more especially as you seem to have lost sight of your own definition, as in a following statement you tell me, after referring to the ascent of the sap, "that it becomes elaborated *in* the various organs, and assimilated to the essential qualities by the action and influence of the atmosphere, and the current or currents of it are accelerated or retarded according as there are vents for its reception." Now I do not

see how you can escape the admission that the leaves are some of those organs referred to. What, then, becomes of your elegant definition? To prevent mistakes, you had better have mentioned at once what organs you really meant.

But we cannot pass over this sentence, as it is peculiarly rich in details. The sap is not only elaborated, but "it becomes assimilated." Let us understand each other. What is assimilation? The changing of one thing into the substance of another; the act of one thing becoming like something else. Then, what is the sap changed or assimilated to?—into cambium, liber, or alburnum? No, that is quite impossible; but into the "essential qualities." And what are these qualities?—are they form, consistence, secretions, &c.? No; all these are found in roots, upon which no zephyr breeze has ever played, and yet you state that all this elaboration and assimilation is effected "by the action and influence of the atmosphere," in conjunction with the doctrine, that there is no regular descent of fluids. The conclusion of the sentence, "that the sap is accelerated or retarded according as there are vents for its reception," I agree with, as a great leading general proposition. Ask me for indubitable proofs, and I will confess my inability to give them—nay, will start an objection. Cut down the branch or the whole of a vigorous-growing vine, when the leaves are fully expanded, and each and every of them "inviting" up the sap from the roots, and no bleeding will take place. Why? Because by taking away the vents for the sap, you have prevented its rising. Very well; but cut down a similar branch or vine just when the buds are expanding, and in this case you likewise take away the whole of those hydraulic pump-suckers, the action of which had brought the sap in motion, and nevertheless it rises vigorously, and flows copiously from the wound. How is this?

I fully agree with you, that what you term the providing and expending organs are naturally inclined to balance each other; but I do more—I contend that these organs have a direct relative and correlative influence. I admit that each part of a plant has an appropriating power, because I cannot otherwise account for the various secretions contained in them. I admit that the stock has an influence upon the scion, or why resort to paradoxes and queries? But I also admit that the scion, though to a less degree, has also an influence upon the stock, by a regular circulation of the fluids. How else can I account for the phenomena, that a variegated shoot frequently starts from a stock that had been grafted with a variegated scion; or that in Mayduke, Bigarreau, and Morella Cherries, their roots should present such a contrast in appearance, though budded upon similar stocks—the two

former exhibiting large naked roots, and the latter a thick dense mass of fibres? If such things prove not a CIRCULATION OF FLUIDS, they prove, at least to my mind, the extreme difficulty of erecting a theory applicable to all cases of vegetable development.

Your answers to several questions respecting your ability to account for certain phenomena upon mechanical and chemical principles, clearly detect and expose a few inadvertent omissions on my part; but you carefully keep your answers from bearing directly upon the matter in hand, namely, that if you could not believe the descent of the sap, nor yet the *assimilation of it to the constituent parts of the system*, because you could not account for either upon chemical or mechanical principles, how do you come to believe in other propositions which you are as unable to account for upon these principles? You may smile at my simplicity in referring you to a seed deprived of its vitality; but, simple though that fact be, it clearly inculcates that in a living seed, as well as in a living plant, there is a great principle existing, to the government of which the laws of chemistry and the principles of mechanics are wholly subservient. What that principle is, I confess myself ignorant of, deeming it wiser to do so, than to pride myself upon the supposition that it is to be found in the phenomena of galvano-, electro-, chemical agency, or in any other equally high-sounding, unmeaning definitions.

It is true its existence is known by its effects, but not its nature; and even these effects are something more than mere "motion, which can neither add to nor abstract from the frame which it expands and vivifies." That the nourishing part of a plant—that which, for the purpose of enriching our phytological vocabulary, you designate the "soul," but a soul possessing neither a particle of vital existence, nor yet in the least degree the power of expansion, as these are solely the properties of the yet imaginary film named *indusium*, which, monopolizing all to itself, allows not a particle of vitality to exist either in the members, or in the tubes of those members through which the nourishing fluids of the system flow—is what appears to me a little too new-fangled, and also too mysterious for a tacit acquiescence. It is wonderful to reflect, that the majestic oak, which has braved the fury of some thousand storms, was once enclosed in the puny shell of an acorn; but more wonderful still to be constrained to believe, that every addition to that oak has proceeded from a membrane, every season dividing itself into three constituent parts, and yet in the end remaining as imperceptible, and yet as divisible, as ever. Only give me a clear view of your *indusium*, and then, with the knowledge of certain facts which could be easily accounted for upon the existence of your theory, I would

almost at once become one of your firmest disciples ; but it is worse than useless to refer me, either by a note of exclamation, or yet an air of triumph, to the existence of cambium ; for if cambium, with all its organisable qualities, be nothing but an expansion of your favourite membrane, then surely we might be able to detect it in some of its successive stages, and especially at the interesting period when a separation takes place between the liber and the alburnum.

But, independent of all analogical reasoning, the ever-recurring question is, What advantage does your theory confer ?—what is its utility ? In grafting, I was never careful of any other member but the uniting of the liber of the scion with the liber of the stock ; and why should you laugh at my simplicity, when, according to your own admission, your indusium, though united to neither liber nor alburnum, is slightly attached to both, especially if I have been fortunate enough to get, through ignorance or disbelief, as much of it as suited my purpose, while the greatest knowledge, and the firmest belief in its existence, would not enable me to get a particle more ?

You have kindly enough desired to elevate me to soar amid the ærial regions, to have my mind expanded and my imagination brightened by holding converse with beings of mist and cloud ; but unfortunately you have not added a cable's length to the strong *тѣнѣ* which has hitherto confined me to this dull clod of earth. Until you have effected this favour for me, you must excuse the muddiness of my conceptions, tinged as they necessarily must be by the circumstances attending their origin. These circumstances may prevent me from perceiving the extent of the similarity between the vegetable and animal economy ; but they do not hinder me from perceiving that the knowledge of the one sheds much light upon the other. True, the comparison may be carried too far ; but this is no reason for making no comparison at all. I freely confess, that, mere sciolist as I am in these matters, I dare not attempt to prove that bone or muscle is formed from blood. You contend that blood and bone are formed simultaneously ; but, allowing this to be the case, are you prepared to show that the blood of the parent has nothing to do with that formation ? Physiologists inform us that the whole of the human frame is completely changed in a very short space of time. How can such a thing be accomplished, unless by means of the nourishing fluids of the system ? It is a fact, which I have often seen recorded, and never questioned, that even the bones of animals become of a certain colour when fed upon particular food, and that the colour varies according as the food is changed. How is such a fact to be accounted for, unless upon the supposition that, after the various processes through which the food passes previously to its amal-

gamation with the blood, it still retains its colouring properties, and imparts these properties to the bone, which it renews? In a certain disease, the name of which at present has escaped me, a new bone grows outside the old one, enclosing it as with a sheath. The successful practitioner removes the old bone, and the plastic new one soon takes the form, size, and place of the one removed, and the limb feels no want whatever. This is not mere expansion; there is formation at work; and if, when holding the old bone of your limb in your hand, you felt you had got a better in its place, what theory would you adduce in explanation of such a phenomenon? It is true that these are facts with which I am not personally acquainted; but were I to believe nothing except what I had ocular demonstration of, my belief and my knowledge would be limited indeed. Although they possess not the most direct, they still have a reference to the matters in hand, as one of your leading propositions is, that "no fluids, such as the sap of plants, or the blood of animals, are capable of becoming organisable." I do not assert that they are capable, but I admit the possibility.

These remarks I submit to your consideration, and conclude with congratulating myself, that if in theory we slightly differ, in practice we so much agree; and really if it was not for the hope that others of my brethren, chiefly the young, might be induced to give the results of their observation, and thus mature a science which is only in its infancy, it would not be worth while discussing the subject, when, as yet, it must be left in a great measure as matter of opinion; either theory, like those respecting caloric, with a little circumlocution, being sufficient to explain the various phenomena which present themselves.

Hyde Park Corner.

ROBERT FISH.

TO MR. FISH.—Dear Sir,—As we have only a few words of rejoinder to make to your foregoing reply, we think it better to place them together, than delay our remarks till the publication of another number of the Register.

For your friendly commendation and compliments, accept our best thanks; and for any misconceptions we may have formed, in attributing to yourself the reveries of others, we shall hope to be forgiven, because, as these reveries were the strongest batteries whence our own opinions were assailed, we, in self-defence, were compelled to turn our artillery against them; and we only trust that we have not, by any random shot, hurt your feelings, or checked your reconnoissance in spying out our fenceless positions.

Your so recent perusal of our little book rendered unnecessary a repetition of our arguments therein used in support of our peculiar

opinions as to two very material points in vegetable physics and economy. We assert that the sap is diffusible, *in all directions*, throughout the system of the plant; but we deny that there is any regular circulation. The difference between diffusion and circulation we conceive to be this:—in the first, the sap pervades every part, like water absorbed and retained by a sponge; the second supposes a constant flux and reflux, or continued ascent and descent in different sets of vessels, acting like the arteries and veins in the human body.

This latter notion has been held by many phytologists ever since the time of Duhamel, but is now discarded, because there is no propulsive organ or organs in a plant to be compared with the action of the heart of animals.

The next point, and which forms so prominent a part of our theory, is, our denial that the sap is “organisable;” that is, we deny the possibility of the various membranes and organs of a plant being formed of or increased by any change of the sap. Our reasons for this denial are two:—first, no organised body, like a plant, can be formed of unorganised matter, which the sap of plants undoubtedly is; and, secondly, no organised body can originate itself, or acquire existence without a previously existing organised rudiment; and as no entire plant can originate itself, so neither can any single organ or member of a plant gain identical existence without a similar origin.

When the doctrine of EQUIVOCAL GENERATION was entertained and believed, the apparent spontaneous production of weeds, of maggots, of reptiles, and of fishes, was easily accounted for;—they were supposed to be the offspring of corruption! A modification of this silly and groundless doctrine was easily applied to explain the unaccountable increase of the stems of trees and shrubs; even certain chemists, for want of due consideration, believed, and perhaps still believe that, by the union of what they call “the great powers of nature,” organised forms might be generated, and continue as additions to the animal or vegetable kingdoms for ever. The same idea leads some naturalists to suppose that creation has not yet ceased, as new species of both plants and animals are every day being discovered, which, they think, were not in existence before. Such notions belong to what is called *transcendental* philosophy, which gains but few converts.

On the above two particulars, viz. the non-circulation and non-organisable property of the sap, the whole of our theory hinges; and if they can be overturned by cogent reasoning and fair (we shall not say indubitable) proof, all our views on that portion of phytological knowledge must fall to the ground.

We think it needless to play the preceptor in correcting some misapprehensions and misnomers in the concluding part of your communi-

cation, more especially as we believe the whole to be written more for the sake of junior readers, and to elicit further details, than for any purpose of justifying your own opinions or those of others antagonist to ourselves. All your objections are founded upon a circumstance, the truth of which we positively deny; and therefore, combating these your objections would only lead us to use the same arguments we have employed repeatedly before.

Concerning the bleeding of a vine, however, deserves notice, because it is a practical matter. It is a well-known fact, that no part of a tree bleeds from a wound, during summer, so much as it does in the spring; and the reason is—in the latter season the juices are in a highly excited state, just awakened from the repose of winter by the increasing temperature of the season; whereas in summer it is exhausted by the evolution of shoots and the perspiring action of the leaves, so that there is no redundancy to escape. The example quoted about the growth of the roots of cherry-trees, is also a well-known fact, and is a direct proof of the correlative connexion between the graft and stock—the former imposing its manner of growth upon the latter, strong shoots making strong roots, and *vice versa*. Attributing to sap the power of giving forms, accords not with our ideas, though we admit it may convey colour.

The remaining part of your rejoinder contains no question which we feel incumbent upon us to answer. Simple questions may be answered, but assertions require a long tissue of re-assertions, which are seldom mutually convincing or advantageous. The "*nourishing part* of a plant" is as obscure to us as *indusium* and its properties are "new-fangled" to you. In describing a membrane which was not identified before, (except under its temporary name of *cambium*;) it was necessary to coin a new term; and we hope that, if our description be otherwise sufficiently explicit, the new term will not be considered a blemish.

Multiplying words, or repeating former arguments on the present occasion, can serve no good purpose, more especially as you seem to think that, however correct, the theory can be of no practical use.

We conclude by again recommending the subject to your notice; and should you hereafter hit upon any practical fact which militates strongly against our peculiar opinions, we shall be glad to hear of it, and will give it our best consideration.—ED.

SIR,—It must be pleasing to all who have an interest in the advancement of the gardening profession, to see with what avidity some of your correspondents have taken up and are agitating the subject of Gardeners' Mutual Instructing Societies. Month after month we find fresh writers on the subject proclaiming to the world the indispensable necessity of

such societies ; and that they are loudly called for, is a fact which I think no unprejudiced person will deny. Gardeners, of all professional men, require the most extended and universal education. To be a gardener, you must know something of almost all the other arts and sciences : a knowledge of *botany, vegetable physiology, land-surveying, drawing, geometry, chemistry, &c. &c.*, are almost indispensable ; and to acquire a sufficient knowledge of these various branches of learning, gardeners must possess advantages which seldom or never fall to their lot. Your correspondent, Mr. Burnham, has truly said, that "the life of a young gardener is a life of privations ;" but he certainly has mistaken the means by which their condition is to be improved, and thence raised to their legitimate station and influence as members of truly civilised society.

These mutual instructing societies, which have been proposed and so ably advocated by your correspondents, are, in my humble opinion, eminently calculated to accomplish the desired object, and I long much to see the project put in execution ; but I fear some of your correspondents who have written upon the subject are more men of precept than example, otherwise they might have had something of the kind established on the "west side of London" long before now : and though I should glory to see such a society formed for affording the young gardener a means of acquiring a scientific knowledge of his profession, I cannot entirely approve of the means and ways taken for its accomplishment.

Had these clever individuals (who will ultimately, I presume, become fathers of the society) fully and distinctly laid the plan of their society before the public, and called public attention thereto—then set about forming it in the best manner their circumstances and situation would admit of—they would have acted the part of real benevolent and praiseworthy members of society, and would evidently have found many young men anxious and ready to tender them their support. But instead of going in this direct manner to the accomplishment of their object, they have kept up a prolix course of mere agitation, which is likely enough to issue in a "bottle of smoke."

Surely there is no lack of young gardeners on the west side of London—at least I should fancy not from there being so many large horticultural establishments in that quarter—such, for instance, as Zion House, Chiswick House, the Horticultural Gardens, Lee's of Hammersmith, &c. &c., which may of themselves constitute a very respectable society, were they all concentrated into one body. But it must be an obvious axiom to all, that, if it never is commenced, it never will be established ; and it therefore becomes an imperative duty

on the part of its projectors to set about doing something towards its establishment without further delay.

That the objects which they have in view are laudable, I think no one will doubt; and that such a society, if properly conducted, would confer permanent benefits on society at large, I think no one will gainsay. It must be evident to all, that education makes the man, and that without it a man is a mere blank in the moral and intellectual world. Give, then, the assiduous young gardener equal advantages with the mechanic, and fear not but he will embrace its facilities;—hold out to him the means of acquiring a scientific knowledge of his profession, and gardening will soon take its proper station among the arts and sciences.

Gardeners, under the most humiliating disadvantages, have preserved the respectability and independence of their order. The wages of the working gardener ever have been, and still are, much below those of any other class of operatives; notwithstanding which, they have always shown a natural tendency to accommodate themselves to their circumstances: and while we find almost every other class of tradesmen, under privatory circumstances, depending upon the general bounty, we almost invariably find gardeners appealing only to the sympathy of those of their own order; this is particularly so in Scotland, where the brotherly feeling of one gardener towards another is truly admirable, though, I am sorry to say, too often played upon. But all good practices and institutions have their evil tendencies, and the friendly sons of Adam in Scotland must not expect to be exempted from this natural evil. It is true, we may be told that this is not the case with those *myriads* of "rough ones" who perambulate the streets of London and its environs in the winter season, in time of frosty weather, calling out "Pity the poor gardener;" but sure am I that I am within the mark when I say, that not more than one professional gardener will be found among every hundred of these spurious knights of the spade, who at that season of the year infest our streets and lanes, and thereby render even the name of gardeners an object of derision and contempt. That these *projected* societies will in some degree prevent this evil, and raise the moral and intellectual character of the profession, is the fond anticipation of

London, July 8th, 1836.

GALGACUS.

REJOINDER TO MR. MEARN'S ARTICLE "ON THE COILING OF VINES."—The assumed "cognomen" of Φιλοσοφος has, it appears, misled Mr. Mearns; for, judging by the note appended to his article by the Editor, he must have conceived that our first paper was written

by one of the parties who had controverted the merits, and indeed the general feasibility, of "the *coiling system*." Were it "germane" to the purpose, we could, in two words, prove to Mr. Mearns' satisfaction, that he does not possess a more hearty friend among horticulturists than we are, nor one who would more willingly arm himself in defence of his cause and practice; but as no apparent good might result from open disclosure, we prefer to retain the assumed disguise, and to appear again under Grecian colours;—the deceit, if such it be, includes no treachery.

To do ample justice to our views and motives, we must dissect Mr. Mearns' article, and examine separately every one of its positions.

The physiological science of *Φιλοσοφία* is first assailed because he advanced the conjecture, that buds are "the *origin* of roots." Mr. Mearns has met it with a flat negation; he sturdily asserts that "*buds* will not turn to roots." We here perceive two opinions which are diametrically opposed to each other—who shall decide between them? We appealed to undeniable facts, and we again unequivocally assert and maintain the correctness of our report of the actual experiments recited at page 243. The only point of real moment is the following:—We asserted, on the ground of our observations, (and also by the analogy of facts traceable in the rooting growth and perfect developments of gooseberry cuttings or layers placed in an inverted position; the points of the shoots and that of every bud being thrust downward into the soil,)—we, on these grounds, asserted that buds became roots, "for *not one* shoot had pushed *upward*" from the parts under ground. Now it may be contended that we had arrived at an erroneous conclusion, unsustained by sufficient evidence; but thus far we do and will maintain our opinion, that although some may believe the thing impossible that buds should *become* roots, we have had proof positive and undeniable that buds placed a very few inches under the surface, either *push out in the form* of roots, or are absorbed, and wholly disappear. We again assert that, in our recorded experiments, we found a vast development of *main* and *secondary* lateral roots at every point where the buds existed when the stems were layered, while in disbudded coils a few feeble fibres only were protruded *at the very lowest extremity* of the stem, and not *one* throughout its whole spiral course under the soil of a pot.

Upon these grounds we have a right to assume that the buds, if they do not literally assume the form of roots, are the accessories of their production; they are systems of life, and contain the embryos of leaves, blossoms, and fruit: without them and their vital energy, roots cannot be conceived to make any progress; and what cutting could take root

were buds or their representatives totally absent? Many herbaceous plants, it is true, emit fibres between the nodes of the leaves [stems?]; but we should recollect that there exist embryos that lie hidden and dormant till called into action by peculiar circumstances. The buds, then, I contend stimulate the production of that granular matter which ultimately seems to terminate in perfect radical processes. I am not aware of any other plant which demonstrates this theory so clearly as a cutting of the shoot of *Erythrina laurifolia* placed in a phial of water, and *that* plunged in a bed of warm tan or leaves. During the course of many days, masses or loosely connected portions of parenchymatous substance, very much resembling the lightest pith of elder, may be observed to collect around the base, and from time to time to detach themselves from it; gradually this pithy matter assumes a more compact form, consolidates, lengthens, and finally throws out a perfect fibre. Trees and shrubs present phenomena somewhat different from those which attend the development of herbaceous species; but all appear to be dependent upon some organised germs of life which are excited into action, and produce roots capable of absorbing the nutritive matter that the decomposition of putrescent substances within their range affords. If *light* be entirely excluded, these germs do not, in ordinary cases, rise in the form of shoots; whether, therefore, they actually elongate into roots, or simply stimulate the production of fibres, themselves vanishing and yielding their substance to the advancing processes, is a matter of indifference to our argument; in either case the buds are found to be originators of radification.

Connected with this most important physiological phenomenon is the inquiry into facts suggested by Mr. Mearns in page 284; and we are happy to be able to adduce the results of an experiment which was begun late in the autumn of last year, and continued to the present day (August 8th). Two very fine rods of the *Black Frontignac*—one of two- and the other of three- year old wood—were cut from a vine trained against a wall; the spurs of the one were pruned back to an eye or two, and *all the buds and embryos* retained; those of the other were entirely cut away—not a shoot, spur, or eye was suffered to remain. The rods were each coiled several times round a very large pot, sixteen inches deep, and nearly twelve inches across; and then the two pots were filled with free, light, turfy loam, and retained under a shed till March 4. It is necessary to observe, *first*, that not *a fibre* of a real root was attached to either; they were cut off the vine above the soil. The one *disbudded* contained about six feet of the *old wood*—the other about nine feet; the *whole of which wood* was coiled under the soil, in close contact with the side of the pot. *Secondly*, each rod was fur-

nished with at least two feet of fine *last-year's* wood, and this was left above the surface of the soil. *Third*, as the object of the experiment was to ascertain the power of rooting individually possessed by each, no pains were taken to excite early growth with a view to fruit, and therefore no heat was applied. On the 4th of March, however, both pots were plunged to their rims into a bed of the leaves of beech and oak, in a peach-pit, and the glasses were put on;—no other mode was resorted to. The leaves did not ferment to any great degree, and therefore but little bottom-heat was generated. As the power of the sun increased, (though the extremely cold and wet weather of April was very unfavourable to growth,) the vines became excited, and the eyes upon the shoot *above the soil*, attached to the coil whose spurs and buds remained entire, pushed with great vigour, and showed several good bunches of fruit. The disbudded coil remained torpid, but at length came into feeble action; the shoots it produced were always feeble—little or no signs of fruit were afforded, and it made no way. The perfect coil continued to support its leaves and clusters, and therefore it evidently had developed efficient roots; but unfortunately the progress of the fruit was arrested by the attacks of slugs, which the leaves concealed; they destroyed the clusters before the blossoms expanded. As it appeared evident after midsummer, that the disbudded plant would not do any good—the growing vine having lost its fruit—the rods above the soil were cut down very low, and only one green shoot from a spur of the best plant was left. On the 8th instant both the pots were taken from the leaves, and their coils examined;—that of the disbudded plant had a sufficiently abundant supply of fine, strong, and white roots of *recent* formation, but there were many joints entirely destitute of fibres. The perfect coil was furnished throughout its entire extent, from the lowest extremity to the point of emergence from the soil, with masses of long fibrous processes emerging chiefly from the bases of the eyes, and exactly at the points where the clusters of embryo-buds are usually situated; almost all the eyes had been either absorbed, or were greatly diminished in size; *not one had* produced an under-ground shoot; and we traced a very large root, which afforded the strongest ground to believe that it had been originally a lateral eye; it differed entirely from the ordinary radical processes, emerged at a point close to the base of an eye upon a small spur, was three times as thick as a common root, and much resembled the root-stocks which produce the tubers of the potato:—we have preserved it, with the spur, in spirit, as a physiological curiosity. It is with pleasure that we give Mr. Mearns all the benefit of this comparative experiment, claiming merely the great efficiency of buds in effectuating

the *earliest* and most abundant development of those radicles which are indispensable to the success of the coiling system.

Our limits are exceeded, and time presses; hence we must defer our further observations to a future period.

Φιλοσοφος.

NOTICES OF BOTANICAL PUBLICATIONS.

EDWARDS'S BOTANICAL REGISTER, continued by Professor Lindley. The August number contains:—

1. *Epidendrum Skinneri*. Mr. Skinner's Epidendrum. This very handsome orchideous plant was introduced from the neighbourhood of Guatemala, by James Bateman, Esq., jun., Knypersly, with whom it flowered last January. Being collected and sent to England by G. H. Skinner, Esq. he has been honoured by its specific name. It bears a fine spike of purple flowers, and blossoms freely. Dr. Lindley compliments Mr. P. N. Don, Mr. Bateman's gardener, for the good management of an imported plant, in bringing it into flower so early. It is also in Messrs. Loddiges' collection.

2. *Aptosium depressum*. Depressed Aptosium. A genus founded by Burchell, and described by Bentham. The flowers are didynamous, and the plant belongs to the order *Scrophulariaceæ*. It is a native of the Cape of Good Hope, and was first raised at Hamburgh, by Dr. Lehmann. It is a greenhouse under-shrub, bearing light blue flowers clouded with darker blue, and relieved by a bordering of white at the eye. It is nearly allied to *Salpiglossis*.

3. *Trifolium fucatum*. Farded (that is, painted or brinded) Clover. A pretty annual, the seeds of which were collected by Mr. Douglas in California, and sent to the Horticultural Society. The flowers are cream-coloured, most of the petals being tipped with rose-colour.

4. *Cratægus tanacetifolia*. Tansy-leaved Hawthorn. Is common in our nurseries, and propagated by grafting on the common hawthorn. The haws are very large, and grow singly, and are recommended as an inferior table fruit. They grow to a tree-like size, and are worth a place in every collection.

5. *Cratægus odoratissima*. Sweet-scented Hawthorn. A common bush on the hills adjoining the Black Sea, and elsewhere in the Crimea. It is propagated like the foregoing, and is a highly ornamental plant, as well from its bundles of sweet flowers, as for its large scarlet fruit.

6. *Douglasia nivalis*. Snow Douglasia, named and described by Dr. Lindley, in Brande's Journal, in 1828. This is one of the new

plants which rewarded the toil of the traveller in traversing the snow-clad mountains in North America. It belongs to *Primulaceæ*, and has been raised in the garden of the Horticultural Society, and promises to be an addition to our alpine beauties, rivalling both the *Erinus alpinus* and the *Saxifraga oppositifolia*. For the sake of the discoverer, it will be a plant much sought after as soon as it is in the trade.

7. *Oncidium Lanceanum*. Mr. Lance's *Oncidium*. An orchideous plant, and one of the most beautiful of the order. It was introduced from Surinam, by John H. Lance, Esq., and being distributed by that gentleman, flowered soon afterward at Messrs. Loddiges', and in the garden of the Horticultural Society. The flowers are large; sepals and petals greenish yellow, spotted with brown; lip bright violet; column purple, and variously shaded. The flowers are fragrant, resembling the garden pink, and altogether very beautiful.

SWEET'S BRITISH FLOWER-GARDEN, continued by Professor Don. The August number contains:—

1. *Pæonia tenuifolia*; var. *plena*. Double-flowered, fine-leaved Pæony. A variety introduced some years ago from the Imperial Garden at St. Petersburg. The single variety is common, but the present plant is much more showy and valuable. It affects a light loamy soil.

2. *Lasiopus sonchoides*. Sonchus-like *Lasiopus*. A common-looking herbaceous plant, introduced by Mr. Anderson, of the Botanic Garden, Chelsea, and raised from seeds received from St. Petersburg. To the botanist it is of some importance, but of no attraction to the florist.

3. *Verbena erinoides*; var. *Sabini*. Dwarf *Erinus*-like Vervain. A dwarf, tufted, herbaceous perennial, bearing crowded spikes of purple flowers. It is a creeping plant, and continues flowering throughout the summer and autumn, and is worthy a place in the flower-garden.

4. *Pentstemon Cobæa*. Cobæa-flowered *Pentstemon*. This is a very elegant plant, and was first discovered by Mr. Nuttall, in the meadows on the banks of the Red River, and subsequently by the late Mr. T. Drummond, in the interior of Texas, who sent seeds to this country, whence plants have been raised in several collections. It is a very remarkable-looking plant, and will be eagerly sought by all lovers of flowers.

PAXTON'S MAGAZINE OF BOTANY. The number for August contains:—

1. *Acacia vestita*. Cunningham's *Acacia*. This species was dis-

covered in the interior of New Holland, by Mr. Cunningham, who transmitted seeds to this country some years ago, and plants were brought to flower for the first time in the conservatory of the Comtesse de Vandes, at Bayswater. It is one of the most showy of the genus, and deserves a place in every collection.

2. *Hibiscus splendens*. Splendid Hibiscus. A native of New Holland, and one of the most beautiful flowering shrubs of the order *Malvaceæ*. Like all others of its tribe, it is easily propagated, and does very well in the greenhouse.

3. *Chironia trinervis*. Three-netved Chironia. This plant was figured and described in the Botanical Register last October, and noticed in the following month by us under the specific name of *peduncularis*. It is a pretty greenhouse shrub, and does very well planted out in the open air during summer. The plant is straggling in habit, and the purple flowers being on very long peduncles, gives it an uncommon appearance.

4. *Nemophila insignis*. Showy Nemophila. A truly beautiful and desirable little annual, found in California by Mr. Douglas. Raised in pots, it makes a very pretty greenhouse ornament, or is very suitable to cover a small clump in the flower-garden. It belongs to the natural order *Hydrophyllææ*.

Besides the foregoing figures and descriptions, this number contains an useful article on the genus *Tropæolum*, in which the different species are described, and directions given for their culture. There is also a similar account of the genus *Lobelia*; together with Remarks on a cheap Method of building Hot-houses; a Review of Smith's Florists' Magazine; Remarks on the Diffusion of Seeds, and on the *Poinsettia pulcherrima*; with a list of new and rare Plants lately described, and some calendarial directions.

SMITH'S FLORISTS' MAGAZINE. The number for August contains the following favourite flowers, viz.

1. *Kalosanthes splendens*. Showy Kalosanthes. This is a hybrid variety, originated by Mr. Miller, of Bristol, between *K. coccinea* and *K. versicolor*, and is a handsome object, deserving of cultivation. The genus is better known by the name *Crassula*, of which the Kalosanthes is a section, separated by the late Mr. Haworth.

2. The plate contains two roses of rare merit, viz. the *Rouge de Luxembourg*, sometimes called the Crimson Moss; and *Rosa damas Leda*, a beautiful pale blush, tipped or blotched with bright purple, which gives it a very pleasing appearance. Mr. Smith has added a few good directions for pruning this and other roses.

3. This plate contains two varieties of the interesting genus *Gladiolus*, raised by Mr. Miller, of Bristol. The whole of the *Gladioli* are legitimate florists' flowers, and deserve every attention.

4. Is a very fine figure of *Pearson's Alexander Polyanthus*. Under the description given of this flower, a few very rational meteorological observations are added to account for polyantheses not thriving in the near neighbourhood of large towns. "At those seasons of the year," says Mr. Smith, "when the weather is most trying to vegetation, a chilling atmosphere sets in towards a large town from all the surrounding country, inasmuch as the artificial heat of the town causes the air over it to ascend, upon the same principle that air ascends in a chimney over a fire. Now it invariably happens, that when cold air, though completely charged with moisture, approaches a warmer place, it becomes a drying or withering air; and this is the reason why delicate flowers, and also the blossoms of the more early and tender fruit-trees, are much more subject to injury in the vicinity of towns than in the open country. In the vicinity of London, the general movement of the atmosphere is from the north or north-east, during that part of the spring which is so perilous to growers of choice flowers and fruits; and for the reasons above mentioned, the metropolis not only has its full share of this blighting wind, but retards it, and thus greatly increases its mischievous effects. In consequence of this, a moderate shelter, in comparatively cold places of the country, suits much better for the polyanthus than the comparatively mild climate of the neighbourhood of London. The whole family, too, though they prefer a pure atmosphere and a dry (that is, a well-drained) soil, do not bear the scorching heat of the sun, which heat, aided by the drying nature of the atmosphere, is peculiarly destructive to the polyanthus. All things considered, it is, perhaps, impossible to bring this flower to any great degree of perfection in the neighbourhood of London; but in other districts of the country, where it is subjected to no such severe trials during the spring, it is at once the pride of the humble cottager and the amateur florist."

There is a great deal of useful philosophy in this extract, which may be applied in the treatment of many other plants besides the polyanthus.

Mr. S. gives also a little history of the genus *Pæonia*, in which their character, culture, and manner of propagation are succinctly described.

NOTICE.

THE AGRICULTURISTS' MANUAL; being a familiar Description of the Agricultural Plants cultivated in Europe, including practical Observations respecting those suited to the Climate of Great Britain; and forming a Report of Lawson's Agricultural Museum in Edinburgh. By PETER LAWSON and SON, seedsmen and nurserymen to the Highland and Agricultural Society of Scotland. Blackwood, Cadell, Curry.

The well-known character, indefatigable industry, public spirit, high and extensive connexions of the authors of this volume, are a sufficient guarantee that the publication is well worthy of the attention of every farmer in the three kingdoms. The value of the descriptions arise from the fact, that the Messrs. Lawson have raised and cultivated almost every plant which they recommend, and keep in their museum, for the inspection of customers, specimens and samples of the various sorts of plants and grain treated of in the volume before us. This is a source of the greatest satisfaction to customers, as very many can form no just idea of a thing from a simple description only. The collection of implements, models, &c., must also be an useful treat to every visiter engaged in agriculture, and other branches of rural economy.

We are glad to see that a supplement is intended to follow, because it will give an opportunity to make some corrections in the Manual, and also to give what we think would be an improvement, namely, a fuller account of all those wild plants which are hurtful to field crops, or dangerous to domestic animals.

CALENDARIAL MEMORANDA FOR SEPTEMBER.

KITCHEN GARDEN.—The principal business of this month is making mushroom-beds, either in sheds or in the open air. Winter spinach will require thinning and weeding; so will the latest-sown crops of endive, lettuce, turnips, &c. Coleworts, and all other sorts of winter greens, may still be planted, if a full stock be not already put out. A last planting of the latest sorts of broccoli may be put out, and a good stock of young lettuce should be planted in frames or on warm-lying borders, to stand the winter; a little more seed may be sown in frames, to be nursed through the same season. Prepare a piece of good rich ground, on which to prick out the cabbage and cauliflower seedlings raised last month. Continue to tie up endive to blanch; earth-up celery and any other rowed crop requiring such assistance; tie and

earth-up cardoons. If the weather continues dry, copious watering will be required by the growing crops, particularly kidney-beans, cucumbers, peas, and all lately transplanted crops. Gather and store onions, shallot, garlic, and kinds of ripe seeds, and flowers, and herbs for drying. Salad plants, viz. common radish, cress, mustard, and rape, may still be sown in frames, under hand-glasses, or close under walls where they may receive protection. Clear away all fallen leaves and decayed stems of crops already used, in order that insects may not be invited to harbour or breed among them.

FRUIT GARDEN.—Take care of the ripe and ripening fruit; that intended for immediate use should be gathered early in the morning, and kept in the coolest part of the fruit-room till wanted. Flat and wide baskets, and the softest white-leather gloves, are requisite in gathering the finest fruit. Protect against wasps, flies, and earwigs; destroy wasps' nests near the garden, and allure them from the fruit by offering phials of sugared water. Wall-fruit trees still require looking over, to displace redundant growths, and keep the leaders close to the wall. Trees suffering from insects should be often and forcibly washed with the engine. Strawberries planted or potted last month will require frequent watering, and to be kept free from runners.

FLOWER GARDEN.—If cuttings or layers made in the last two months are sufficiently rooted, they may be removed to beds, or into pots, where they are intended to flower. Carnation layers and pink pipings, as well as all others raised in the same way, come under this direction. Auriculas should be cleared of dead leaves, the surface of the pots freshened up, a little fresh compost added, and if any require shifting, it may now be done. The seeds of anemones, ranunculuses, &c., may still be sown in pans or boxes, if not already done. Dahlias are now in full beauty; and the Chinese chrysanthemums, whether potted or not, require frequent watering over head to accelerate their growth. Prepare the greenhouse for the reception of the plants about the 20th, and if any require shifting, it may be done previously. Also prepare the beds intended for tulips, hyacinths, &c., by trenching and additions of fresh compost. The beauty of a flower-garden in the spring depends very much on the preparations and dispositions made in autumn. *Foresight* is an indispensable faculty of the flower-gardener.

COTTAGE ECONOMY.

A RESPECTED correspondent, whose views are of the most laudable and philanthropic description, has directed our attention to the occa-

sional introduction of advice or directions to cottagers relative to the management of their little gardens, or other objects which tend to the welfare of the inmates of these humble dwellings. This was from the beginning a part of the scheme on which the Horticultural Register was to be conducted; and accordingly a good deal, at former times, has been published on the subject.

To give us an idea of the kind of information for cottagers which our correspondent deems most essential, he has kindly sent us a small pamphlet of thirty-four pages, "*drawn up at the request of the Royal Horticultural Society of Cornwall*," by W. B. Booth, A. L. S., a member of the committee.

We are well acquainted with the professional and literary abilities of Mr. Booth, and of course can have no objection to enrich our pages with anything falling from his pen, if we encroach not on the privilege of the society for whom the tract was written. But as our correspondent does not seem to think that any occasional extracts we may from time to time introduce into the Register will be any invasion of the publisher's rights, we shall comply with our correspondent's wish.

The "Cottager's Manual" was first published in 1834, and a second edition has been printed. It is principally a gardening calendar for the cottager; to which is added, "Special Directions for the Management of Bees." There are also subjoined, "*Rules for cultivating Labourers' Gardens; with Work for each Month, and a List of Garden Plants in Flower throughout the Year.*"

Like other calendars, it commences with the first, and ends with the last, month of the year. We extract the "Directions" for the present month:—

"*September.*—**BEEs.**—This is an important month to the cottager, as he will now begin to reap the fruits resulting from the care and attention he has bestowed on his hives. Those intended for store should be selected first; the others are then to be *put down* in the usual way, by suffocating the bees—a method so generally known as to render any remarks unnecessary.

"Work to be done in the Garden.

"**FRUIT.**—Plant strawberries, if not done last month. Gather such apples and pears as are now ripe, and lay them up carefully for keeping a few months. Choose dry weather for gathering all kinds of fruit.

"**FLOWERS.**—Plant crocuses and other flowering bulbs. Remove layers and pipings of pinks to the places where they are to remain. If any Hollyhocks, Canterbury Bells, Sweet Williams, &c., were sown in February, they should now be planted out.

" **VEGETABLES.**—The operations of this month are limited to the clearing off all decayed leaves, haulm, &c., so as to preserve neatness, and make room for other crops. Attend to the growing crops of broccoli, cabbage, &c.; draw earth to their stems, to prevent them being blown about by the wind. Cut parsley close to the bottom, in order to have young leaves for winter and spring."

REMARKS ON THE WEATHER

THE changeable character of the summer still continues, and upon the whole, since our last report, has been rather favourable for growing crops than otherwise. Soon after the beginning of the present month we had very dry and warm weather; during the second week it became changeable, with frequent showers, which latter have been particularly beneficial to many crops in the kitchen garden. Kidney-beans have been reinvigorated, and are bearing abundantly: celery, broccoli, and all summer-planted crops have had a fair start.

There is, in many places, a fair sprinkling of apples, and mulberries and walnuts are plentiful, but pears and plums are a scanty crop. These different results are consequent upon the state of the weather when each of the kinds were in blossom in the spring. Pears and plums which flower early are very often cut off, especially in sheltered situations, and therefore the latest-flowering varieties of all kinds of orchard fruit are the most to be depended upon for a crop.

Notwithstanding all our lists of fruits, with modes of culture, size, colour, and qualities of the fruit respectively, there is still one thing wanting which should accompany these lists, namely, their *times of flowering* comparatively with each other. This particular, so generally neglected in making a practical registration of circumstances relative to the growth and times of ripening of our common fruits, is ably and strenuously recommended by an intelligent correspondent in a late number of the Register, whose advice is well worth the attention of nurserymen and others engaged in the culture of our different kinds of orchard fruit. A three or four years' attention to this matter would enable a careful observer to draw up a very useful adjunct to our treatises on orcharding.

August 25th.

PAXTON'S
HORTICULTURAL REGISTER,
OCTOBER, 1836.

HORTICULTURE.

ON THE EXPEDIENCY AND EFFECTS OF GRAFTING.

GRAFTING is a very ancient custom, as we read of it in very early writings. It is more than probable that it was first practised in the cultivation of fruit-trees, to perpetuate a favourite kind which could not be propagated with certainty by sowing the seed. All the wild originals of our garden and orchard fruits have been, by accident or continued culture, changed from comparative worthlessness to valuable products, in size as well as in quality. In the accomplishment of these results, the art of grafting has been mainly instrumental; for by transferring a shoot of an improved variety to the young stem of a kindred seedling, the true kind was thereby obtained, and in any desired number.

The advantages of grafting are manifest, and its effects upon the constitutional habit of both graft and stock are various, and form a valuable portion of the cultivator's knowledge. It is a subject well worth inquiring into, as it may lead to a right understanding of the operation itself, as well as to the attainment of those advantages which may be derived from a proper choice of the graft and stock.

We may first premise, that experience has taught us that a perfect union by grafting can only take place between congenial natures. Two individuals of the same genus of plants, and in some instances two individuals of the same natural order, which the improved science of botany hath associated, will unite by grafting, and become one tree. We may next premise that almost all plants, and certainly all fruit-trees, have to pass through a season or stage of adolescence, during which

they are naturally barren. If a cultivator intend to raise a fruit-tree from seed, he must wait with patience until the stripling arrives at a mature age, before he can expect it to bear fruit. In this case, the advantage of grafting a mature part of the head of an old tree upon the vigorous stem of a young one, is very obvious; because its period of youth is much curtailed, or wholly disappears, as grafts have been known to bear fruit in the first year. This, however, but seldom happens, nor indeed is it to be wished, as no fruit-tree should be allowed to bear before it has acquired a reasonable size of head.

Besides the advantage of transferring aged and mature wood to young stocks, the operation has another effect, which is equally serviceable to the cultivator, and that is, its tendency to check luxuriant growth—a circumstance which renders the grafted tree at once more dwarfish and more fruitful; and as these circumstances are usually consequences of each other, it is an improvement clearly attributable to the operation of grafting.

The practicability of grafting, as well as budding, depends on the readiness with which the elements of the scion and stock unite; the living members of both being placed in close contact at the season when both have begun, or are about to begin, to swell under the flowing sap, instantly coalesce. If the scion and stock be nearly of a size, the junction becomes so complete, that in a few years it is scarcely discernible, more especially if both are equal in habit of growth or membranous structure; but if one be of a grosser habit and ranker growth than the other, they increase in diameter unequally. If an apple scion be grafted on a white-thorn, or a pear on a quince stock, the grafts in both cases are engrossed much faster than the dwarfer-growing stocks: of course the junction is always apparent, and sometimes extremely unequal; for though there is a free intercommunication of the sap, the specific difference of the woody structure or vascular fabric being unlike, causes the difference in the diametric bulk.

On examination of the grafted part of a stem of several years' growth, by cleaving it perpendicularly, or cutting through the graft transversely, we see that there is an intimate union between the layers of wood which were about to be formed when the operation was performed, and of all the subsequently formed layers of both; but between the wood of the graft and stock which was formed before the performance, though closely and soundly adhering to each other, there is a visible division, marked by a brown line, where the two surfaces made by the knife were joined. The union of these is, however, no more than a simple adherence by means of secreted sap acting as a cement, but not certainly by any interjunction of the woody fibres.

Another advantage arising from the practice of grafting, is the certainty of perpetuating the true kind of fruit ; for although it has been affirmed that the qualities of pears are deteriorated by being grafted on the quince, and that some sorts of apples are impaired in quality, and altered in colour, by being worked on certain stocks, such reports have not hitherto been confirmed ; and, therefore, it appears that whatever may be the state or quality of the sap, as supplied by the roots of the stock, it very soon becomes assimilated to that of the graft, if indeed any assimilation at all be necessary.

A good deal of skill is, however, necessary in adapting the scions to the proper stocks, in order to assist diminutive growth, by placing on strong-growing stocks, or the reverse. The habit or manner of growth of the tree whence the graft is taken, is conveyed along with it ; and not only the permanent habit, as is exemplified by the weeping-ash, but accidental flexures which sometimes occur in upright-growing trees, if these bowed shoots are used for grafts, and it is very likely that the future shoots from that graft will be also drooping, or unusually bent. We have elsewhere remarked that this circumstance happens sometimes in working the Jargonelle Pear. This tree, in favourable situations, is sometimes apt to produce very strong summer shoots, which, from the weight of their foliage, or some other cause, droop downward in a waving direction. These, if used for grafts, make very unsightly maiden plants, and afterward require much training to get them into shape and moderate growth.

Any other peculiarity of growth or habit of the mother-tree is certainly conveyed along with grafts produced by it ; and, moreover, it has been said that, not only disease, but even the age and decrepitude of the parent, are conveyed to the young trees raised from its shoots.

This idea was first promulgated by T. A. Knight, Esq., President of the Horticultural Society of London, and from a belief that young trees actually inherited the infirmities of their aged parents, which accounted for the general failure of apple-trees that happened about the time that gentleman wrote his "Treatise on the Apple and Pear" (about 1795). To strengthen his opinion, he argued that, as these fruit-trees are only *varieties*, they had, as such, only a limited period of life ; and when that period had elapsed, the whole of any given variety, old, and young, and middle aged, dropped to decay together.

These new doctrines produced a strong sensation, particularly among nurserymen who happened to have large stocks of the proscribed varieties ; and so feasible were Mr. Knight's representations, that many

acted upon them in so far, that they preferred to plant the newest sorts rather than the old ones. The circumstance which suggested the idea to the worthy President was not only apparent in Herefordshire, but, at that time, all over the kingdom. The old Golden Pippin, the Styre, and Fox-whelp, were failing in all directions around Mr. Knight's residence, in Herefordshire, and adjoining cider countries; and the first of these, a great favourite everywhere, became almost barren, and was visibly failing all over the kingdom.

We well remember discarding and throwing out a good many Golden Pippin trees about that time, which had been planted for five or six years, without making the least progress in growth; but rather declining. Two of these outcasts being planted in a new shrubbery then making, (the ground having been deeply trenched,) grew away surprisingly in their new place, became abundantly fruitful, and are now large and healthy trees.

This result showed that there was no constitutional decrepitude or irrecoverable decay in this variety of apple; and the same results having happened to other planters who had planted the proscribed sorts on properly prepared ground in different parts of the kingdom, the impression against them wore off, and now it is almost forgotten.

It is quite true that nurserymen have no credit, nor the trees they sell approved, if the buyers only stick them into a round deep hole in an old orchard or garden, without other preparation. This mode of forming or replenishing orchards was very common, both before and since the period alluded to. A person resolves to make an orchard of one of his meadows; he digs ranks of holes, buys standard trees, puts them in, relays the turf, stakes and bushes the stems to keep off sheep, and bids "God speed." The consequence of such a proceeding is, that the trees, from being so carelessly treated, become stunted, and at the end of five or six years, perhaps, are less than they were when planted. We make this observation because we know that the failure of new orchards, so planted, was accounted for, and the mismanagement excused, on Mr. Knight's principle—viz. that the kinds were "worn out."

But we know well that Mr. Knight's ideas respecting new varieties of plants, herbs, as well as trees, are not altogether erroneous. We have written something on this subject in our last number, at page 322; and we are quite convinced that, in the first years of the existence of a new variety of a plant, it grows with greater vigour than it continues to do after it has become an old inhabitant of any one place. In this opinion Mr. Knight was perfectly right; and it may have happened that many of the favourite varieties of apples being aged trees, presented

a simultaneous decay, and so confirmed, while it sanctioned, the suggestion of the President.

Although it is our own opinion that disease, as the canker, and insects, as the American blight, may be carried by the graft from old to maiden plants; yet we believe that, if a perfectly mature and healthy scion, cut from the top of an old tree, be inserted on a suitable and healthy stock, the future expansion of the graft will be as free from decrepitude (except only from the effect of working) as the first shoot which rose from the original seed.

We may now allude to other effects of grafting. If a strong and rampant-growing kind of tree be engrafted upon a weakly-growing stock, the latter will be much engrossed in the structure of its roots; and if a tree having numerous and attenuated spray, be placed on the same kind of stock, the future roots of the stock will be proportionately subdivided and unusually fibrous—a proof that there is an intimate connection between the branches and roots of trees, and that the demands of the former impose their manner of expansion upon the latter.

We may also notice a remarkable circumstance which accrues from the kindred operations of grafting or budding, viz. a variegated species worked on an unvariegated one, will be accompanied by variegated suckers rising from the unvariegated root. This shows to a certainty that there must be a subsidence of somewhat from the graft to the stock; but what that may be, is not so easily explained. Mr. Knight, and several other very eminent vegetable physiologists, maintain that no part of the graft ever extends itself down from the point of junction with the stock; indeed this is evident to any one taking the trouble to dissect the parts at any time after the operation is performed. But then the question recurs—What else can convey the discoloration of the leaves and bark of the graft to those of the suckers so far below? If the variegation of leaves and bark be what it is considered to be—namely, an accidental inherent *disease*—the malady may be extended or communicated by the admixture of the sap, or by a downward contamination of the cellular membrane; but whether by the one means or the other, is a doubtful question, although the fact itself is unquestionable.

As fruit-trees are rarely fertile till the vigour of youth is moderated, and some varieties are always too luxuriant to be good bearers, working them upon others of more diminutive habit may effect valuable improvements, whether the strong be inserted on the weak, or *vice versâ*. Double-working fruit-trees certainly induces moderate growth and consequent fruitfulness; and it is an expedient which is not so much had recourse to as its importance to cultivators deserves.

Root-grafting is often practised, and is, or may be, of great service to the propagator of choice exotics, for which proper stocks cannot be had. A small twig of the head, placed on a spare root of the same, may raise another plant, which cannot be done, perhaps, by any other mode of propagation.

To show how necessary it is to be acquainted with the most suitable stocks for working fruit-trees on, we subjoin a list of the proper stocks for the finer varieties of peaches, viz. :—

Early Anne, Purple Alberge, White Magdalen, Millet's Mignon, Late Admirable, Incomparable, Scarlet Admirable, Smith's Early Newington, Red Magdalen, Montauban, Noblesse, Early Admirable, Old Newington, Old Royal George, Rambouillet, and Catherine, are all sorts which take and grow best on the *Muscle Plum*; and the following do best on the *Brompton Stock*, viz. :—

Avant Rouge, Pourpre Hative, Belle Bauce, Early Galland, Belle Chevereuse, French Mignon, Grimwood's Royal George, Kensington, Double Montagne, Superb Royal, Barrington, Bourdine, Bellegard, Chancellor, Late Purple, and the Titon de Venus.

Many other kinds of fine plums, pears, apples, &c., require peculiar stocks, to which we shall have occasion to revert at some future opportunity.

LANDSCAPE GARDENING.

LETTER SIXTEEN.

DEAR SIR,—As my stay at Fairfax Hall is to be prolonged for another week, I have resolved to close our correspondence with a few general remarks on the different styles and leading character of the places and scenes which I have visited, and which I have in my previous letters given some account.

You will have observed from my feeble description that the place at which I am residing, is one of unmixed beauty; I mean, such a composition of scenery as is considered by painters and connoisseurs of landscape as one of simple *beauty*, as distinguished from other scenery denominated *picturesque* or *sublime*.

Here the rich, though bland, character of the principal building, the harmonious undulations of the general surface, the softly varied effect of the woods, the smooth and verdant turf, the mild reflections from the placid lake, all impress the idea of unruffled repose; while at the

same time the great variety of objects, and the numerous herds and flocks scattered in all directions over the lawns, banish that *insipidity* which so often accompanies purely beautiful scenes of equal extent. Nor is simple beauty the only characteristic of the place ; it is so intimately blended with utility, and with every comfort and convenience of a country residence, that a visiter must possess most fastidious ideas indeed, who could survey such scenery and dispositions without pleasurable emotion and unqualified admiration. It is true that some eyes, like some palates, require irritation ; a flickering scene of strong contrasts of forms and colours is more attractive than a quiet pastoral view : a high-seasoned ragout is more poignantly relished than a plain joint ; but both eye and palate must be, I think, in some degree vitiated, which could derive no real pleasure from the one, or gratification from the other.

Such scenery, however, as already stated, is not that which a painter would choose for his canvas, merely because there is too much sameness of aspect, too much mildness of tint—too much, in fact, of what a painter would perhaps call tameness ; and yet, from some stations on the pleasure-ground walk, and others in various parts of the park, he would find some most interesting scenes, in which every thing and disposition suitable for a picture are combined ; and more especially under a noon-tide sun, when the shadows are most intense, and the catching lights most bright.

It is this style of scenery which landscape gardeners in general are most ambitious to create, and in which they endeavour to excel : and if “ the genius of the place,” as it has been called, does not militate against such a style, it is quite right it should be executed, because it obliterates every mark of roughness and neglect, and imposes an appearance of dressy neatness, which is sure to please every eye untainted by the affectation of the gallery.

But, as before observed, it is for this exclusive love of beauty and neatness that many landscape gardeners have been blamed ; not for their execution of it where it was called for, but for an indiscriminate application where improper. How many fine old castellated mansions, say their opponents, have been set out on a naked lawn ? How many rich masses of wood, which appeared to embrace and shelter the residence, have been anatomised for the sake of smoothness and a bedizened clearance ? and how many necessary and legitimate accompaniments of a dwelling have been removed to a distance, merely because every window should, as much as possible, look out upon a piece of naked lawn ?

All this is very true, and wherever such a style of improvement has

been executed, it may have produced *baldness* rather than beauty; and however right such a design might be for the embellishment of a place like Fairfax Hall, it would be improper, and perfectly inconsistent with the character and architecture of such a place as ——— Abbey; for, supposing an improver of this stamp were employed to impress his ideas of beauty on the abbey grounds, it is probable he would begin by demolishing the ancient entrance-gate, lodge, and lofty wall, which he would call repulsive, to be replaced by a light palisade gate between two elegant lodges built of hewn stone, flanked by an iron palisade fence. He would next thin the thick wood through which the approach passes, clearing away all the undergrowths, in order to have a carpet of turf spread out on each side. This done, he would next expose the tunnelled stream, widen its channel, and regularly slope its banks, to be covered by the smoothest turf; and over the stream he would throw an elegant white-painted bridge, as a beacon to the front door of the abbey, and which he would make ostensibly inviting by clearing away every intervening obstruction of trees or shrubs which might impede a full display of it.

He would be shocked to see the abrupt bank on the east side of the house, and the irregular course of the stream down the vale. The first he would slope regularly from the base of the building to the water's edge; the latter he would confine in an accurately excavated serpentine channel, visible perhaps its whole length, and only diversified by patches of young trees, in *threes* and *fives*, on the points of the bends of the river's course.

He would next complain of the suffocating closeness of the woods on each side of the valley. These he would dismember by cutting wide openings or glades, to reduce the impenetrable screen of wood into ranks of clumps, clearing all rough undergrowths which may have sprung up in the course of time beneath or round the skirts of the old wood. It is probable, also, that this Brownist would condemn some of the venerable trees standing near the mansion, as being too heavy, and making the building much less conspicuous than he would wish it to be.

The improver's idea, in the execution of all these different proceedings and alterations, is to give the place an air of *lightness and gaiety*; and by the trim neatness into which he moulds every feature, to show that the hand of art and refined taste has been employed upon it. He would feel it his business to change the lugubrious aspect of the place, by banishing every appearance of natural accident, or roughness indicative of neglect.

Now this is a case demonstrative of the impropriety of attempting to

give the environs of such a building a character of simple beauty, because it would be here incongruous. The history and style of architecture of the principal object of the seat requires the preservation of every mark of antiquity, and of every sign of its former state. The subdued sober grey colour and irregular outline of the building would not at all harmonise with the general smoothness and fresh greenness of the surrounding lawn; and, as has been said on a somewhat similar association, the abbey would appear like an aged matron dressed out in the most flaunting attire.

The above is an instance of how a landscape gardener's endeavour to produce beautiful scenery in an unsuitable place would be a failure, and is a proof of what the best judges have written on the subject—namely, that unless the artist studies “the genius” of the place, and its natural character, he can neither add to nor take away from it with success.

But the art and profession of landscape gardening embraces a far more extensive range than the mere creation of unalloyed beauty; and its professors, it is to be hoped, have much more expanded and comprehensive views than to confine themselves to the simple exploits of levelling, sweeping, and tracing flowing lines. They cannot but be sensible how very interesting those scenes are which are called picturesque, and how much more skill and taste is required to form or improve them than those which are simply beautiful.

Picturesque scenery exists in many parts of this kingdom, and not only within parks, but even within the bounds of pleasure-gardens. On the management or disposition of those spots the professional man may be called on for advice, and he cannot have a more pleasant task. And here he will find a painter's ideas of what forms, or will in time form, fine pictures, will be of the greatest use to him; and therefore a knowledge of what the great masters have done, both in their paintings and drawings, should be well studied by the landscape gardener.

Besides beautiful and picturesque combinations of visible objects, each of the objects, individually considered, is either beautiful, or picturesque, or ugly: their surfaces also are either agreeable or disagreeable; and the like differences exist as to the colours of objects.

Of the combinations I have already said as much, perhaps, as is necessary; but it remains to add a few observations on forms and colours.

And, first, of the form of buildings. It has been observed by a writer of very great taste in these studies, that a house or temple of Grecian architecture, in its perfect entire state, and its surface and colour smooth and even, either in painting or reality, is

beautiful. Of water it has been observed that a calm, clear lake, with the reflections of all that surround it, seen under the influence of a setting sun, is, perhaps, of all scenes the most congenial to our ideas of beauty in its strictest and most general sense.

Among trees, the young ash and beech, the weeping willow, and the deciduous cypress, are truly beautiful, owing to their light and airy shapes, the delicacy of their foliage, and their graceful positions.

If we look for beauty among domestic or wild animals, we should prefer the sleek and pampered charger, the silky-coated spaniel and greyhound, or the sprightly gazelle. Among birds, too, how many striking instances of extreme beauty are exemplified in their plumage: instance the cream-coloured dove, the windhover hawk, and even in the encaged canary-finch; not to mention scores of others belonging to the feathered race, as well as among fishes, insects, and flowers.

Among the human race examples of the most perfect beauty are everywhere met with, and not only in Circassia, but over the greater part of the world, and which will bear comparison with the finest forms of the sculptor, or the most finished Madonnas or Magdalens of a Guido.

These are a few of what are esteemed beautiful objects in nature, and their counterparts are what is called picturesque, viz.:—

All buildings in ruins, whatever may have been their style of architecture. A Grecian palace, however beautiful at first, is changed into a picturesque object by the mouldering hand of Time; “first, by means of weather-stains, partial incrustations, mosses, &c.; it at the same time takes off from the uniformity of its surface and of its colour—that is, gives it a degree of roughness and variety of tint. Next, the various accidents of weather loosen the stones themselves; they tumble in irregular masses upon what was perhaps smooth turf or pavement; these are soon overgrown with wild plants and creepers, that crawl over and shoot among the fallen ruins; sedums, and other plants which bear drought, find nourishment in the decayed cement from which the stones have been detached; birds convey their food into the chinks; and yew, elder, and other berried plants project from the sides, while the ivy mantles over other parts, and crowns the top.”

Gothic architecture is generally considered as more picturesque than Grecian, upon the same principle that a ruin is more so than a new edifice. The first thing that strikes the eye on approaching any building is the general outline against the sky, (or whatever it may be opposed to,) and the effects of the openings. In Grecian buildings, the general lines of the roof are straight; and even when varied, and adorned by a dome or a pediment, the whole has a character of sym-

metry and regularity. An antique cottage, with its usual accompaniments—its mossy thatch-pointed gables, dormer windows, overhanging trees, and rustic porch and fence—is truly picturesque, and often arrests the wandering eye, when buildings of a more substantial and respectable appearance are disregarded. In a ruined cathedral or abbey is displayed the triumph of the picturesque; and its charms to a painter's eye are often so great as to rival those of beauty itself.

A cubical pile of stone or brick work, destitute of any projecting members, whether the house be large or small, (though the larger the building may be, the worse,) is lumpish, and, in the eye of taste, is positively ugly.

Stagnant water in a muddy ditch or pool, covered with green scum, and filled with rushes and noxious weeds, is naturally disgusting and offensive.

Picturesque trees are such as have arrived at their full stature, and are verging to decay, having parts of their "spreading honours" dead or mutilated, the bark rugged, and fringed with moss and shaggy lichens. Of such, the British oaks show this character most frequently, more especially when they stand singly on the banks of streams or high roads, or on naked heaths, and have been scathed by lightning. Other trees are naturally picturesque in outline, such as the cedar of Lebanon, the weeping elm, and some others.

Picturesque animals are, the ass, the camel, goat, Pomeranian dog, and the lion with his shaggy mane. The eagle, and almost all large birds of prey, are picturesque objects; for, however smooth their plumage and varied their colours, the crooked form of their beaks and talons detracts from any impression that may be had of their beauty.

Among our own species, the manner and condition of the dress make very great differences. Beggars, gipsies, and all such rough tattered figures as are merely picturesque, bear a close analogy, in all the qualities that make them so, to old hovels and mills, to the wild forest horse, and other objects of the same kind.

If from nature we turn to that art from which the expression itself is taken, we shall find all the principles of picturesqueness confirmed. The pictures of some of the great masters are known by their peculiarly picturesque style, their abrupt and rugged forms, sudden deviations, and the rough and broken touches of their pencil in characterising the objects they represent.

"Picturesqueness, therefore, appears to hold a middle station between beauty and sublimity, and on that account, perhaps, is more frequently and more happily blended with them both than they are

with each other. It is, however, perfectly distinct from either; and with respect to beauty, it is evident that they are founded on very opposite qualities—the one on smoothness, the other on roughness; the one on gradual, the other on sudden, variation; the one on ideas of youth and freshness, the other on that of age, and even of decay.”—
PRICE.

(To be continued.)

MISCELLANEOUS INTELLIGENCE.

WE extract from *The Magazine of Domestic Economy* (one of the most useful and amusing periodicals now in course of publication) a little history of the drug Camphor, which we consider interesting.

“There are two kinds of camphor—that procured from Japan, and that produced in Sumatra and Borneo; the latter is called Malayan camphor, and is obtained from the *Laurus camphorus* of Linnæus. Crawford unites with Colebrooke in giving this tree the name of *Dryobalanops camphora*, [probably the *Cinnamomum glaucum*, or the *C. culilaban*, both Japanese trees,] and adds that it is not a laurel, like the camphor tree of Japan. However this may be, it is an evergreen, equal in size to any of the huge forest-trees of the countries in which it grows. Its geographical boundaries are extremely limited. Borneo and Sumatra are the only two countries in the world in which it has been discovered; and even in these islands it is not found to the south of the line, and to the north, not beyond the third degree of latitude. The tree has a handsome appearance, is much branched, and its trunk is clothed with a smooth greenish bark. The leaf is spear-shaped, of a pale yellowish green on the upper surface, and sea-green underneath. The flowers are insignificant, white, and growing in roundish clusters; the fruit resembles that of the cinnamon tree. The wood is much used, as it has a strong scent of camphor, which preserves it from destructive insects; even the carpenter bee, which penetrates the hardest wood in order to form its nest, does not attack the camphor laurel. The tree is not cultivated, and does not invariably yield camphor: the presence of the drug is known by the oil which exudes from the crevices in the principal branches. The oldest trees in general contain the largest portion. In order to obtain it, the tree is cut down, and the large perpendicular vein [?] in the centre of the trunk, and the knots of the wood, being opened, the pieces of camphor are picked out with a sharp instrument: the smaller ones are procured by means

of rasps, to which the camphor adheres, mixed with particles of wood and other extraneous substances; from these it is separated by washing it in strong soap, and by filtration through sieves. It is imported into the country in small spongy masses, of a dirty yellowish colour. The Venetians were formerly the only people who understood the art of preparing this crude drug, so as to render it fit for the European market; the Dutch afterwards acquired the process, which they carefully kept secret; at present large quantities are refined by English druggists. The method employed is extremely simple: chalk or lime is the substance used in the preparation; the camphor then assumes the clear compact appearance which it presents to us. Great quantities are exported from Borneo and Sumatra to China; and as it is never reimported, and the quantity is too large to be consumed by use in that country, it is supposed to be required in the composition of the Chinese camphor, which bears a high price in Europe; whereas, in the East, the Malayan camphor is most esteemed. The tree has no genuine name in any native language; the drug it yields being an object of commerce with strangers, and not in demand by the natives of the countries which produce it, is accordingly recognised by a foreign name. The word *kapur* is either from the Persian or from the Sanscrit *kapura*. The principal mart for the commodity is Barus, on the north-west coast of Sumatra; and hence that name is used by traders to discriminate between it and the produce of Japan. The latter drug is obtained by distillation, in the following manner:—The root and extremities of the branches, having been cut into thin chips, are placed in a net fastened to a wooden frame, and suspended in a kind of still, or iron pot, the bottom of which is just covered with water, and to which an earthen head, lined with rice straw, is fitted. Heat being applied, the steam of the boiling water penetrates the contents of the net, carrying the camphor into the top of the still, where it hangs like snow upon the straw, presenting a beautiful appearance.

“Oil of camphor exudes spontaneously from the old trees in Borneo and Sumatra; it is also procured by incision, thus:—a slice is cut off from the trunk, sloping inwards, so as to leave a horizontal shelf: in this a sort of cup is hollowed out sufficiently large to contain a quart; a lighted reed being then held in the cavity for about ten minutes, the juices of the tree are attracted towards the hollow, which, in the space of a night, is completely filled with oil: the flow continues for three nights longer, after which a fresh application of heat is required, and a further supply, but less plentiful, is obtained.

“Besides the trees just mentioned, camphor may be obtained by distillation from the roots of almost all the *Laurineæ*, and likewise

from those of ginger, sedoary, and galangale, which belong to the order *Scitamineæ*.

"The laurel is admired for its noble beauty, even in its native country, where a deciduous shrub is almost as rare as an evergreen is with us; and the useful qualities of many of the species are equal to their beauty. The bark of the *Laurus benzoin* was used as a spice in the United States during the American war; the gum of this tree is the *frankincense* of the East Indian islands, and is exported in large quantities to the Catholic and Mahometan countries of the west, to be used as incense. The benzoin tree also grows in Borneo and Sumatra, but is occasionally found to the south of the equator. It does not grow to any considerable size, and is an inhabitant of the rich moist plains, where it is an object of cultivation. The plants are raised from the seed, a small brown nut, and in their seventh year are productive. The gum is obtained by wounding the bark near the origin of the lower branches. During the first three years it is of a clear white colour; afterwards it becomes brown; and after ten or twelve years the tree is cut down, when, by scraping the wood, an ordinary gum is obtained. The current name of gum-benzoin, in the Indian islands, is *Kamingan*. From it benzoic acid is extracted."

We have noticed this account of camphor for the purpose of recommending the use of it to our readers as an insectifuge. Furniture or utensils made of camphor-wood are safe from the worm. Cabinets of natural curiosities, if camphorated, are rendered offensive to all sorts of larvæ, and the curiosities protected from their depredations. Hence a question suggests itself—Could camphor be useful in any way to the gardener? Would it offend and banish wood-lice from frames? or, if a frame were strongly camphorated, would its effluvia free infected hot-house or greenhouse plants from red acarus, or thrips, or other insects living upon them, if set for a few days in such frame? Experiments may be made to ascertain the effect of such a powerful vermifuge, and some useful discovery made, perhaps, to recompense the experimentalist.

How it may be applied is another question. In cabinets, we believe, little grooves are made in the interior of the drawers, in which small pieces of camphor, in the state of gum, are placed, which are found effectual in keeping away the small insects so troublesome to collectors; and, as oil of camphor or camphorated spirits are purchaseable, in either state, perhaps, the remedy may be more conveniently applied: or, again, perhaps a small box of the gum, or an open bottle of the spirits, set in any place where needed, might prove a defence.

These observations are thrown out with the view of calling attention

to the subject. There is nothing more annoying to the person who has the charge of a collection of valuable stove-plants than the attacks of insects, which, from their small size, are scarcely visible, and, from their great numbers, unconquerable. The want of an effectual and easily-applied remedy, which, while innoxious to the plants, would destroy or banish the vermin, is severely felt in some large establishments, as many curious plants are lost, or preserved with difficulty, only in consequence of insects (*Psyllidæ*, *Thripidæ*, *Aphidæ*, and *Coccidæ*) seating themselves upon them, and in such nooks and corners as no brush or topical labour whatever can dislodge. Such plants are, Cacti, Mammalaria, and some of the Aloes. No remedy but such as are liquid, vapourous, or as powder, can reach the retreats of these little plagues; and, therefore, some such remedy is a *desideratum* requiring the attention of every one engaged in the cultivation of plants.

ON INCREASING THE SIZE AND NUMBERS OF TUBERS, &c.—It was long since made known by the President of the Horticultural Society of London, that, by divesting potato plants of their flowers and fruit, the tubers would be increased both in size and numbers. This was a very rational suggestion of the worthy President, and quite consistent with the laws of the vegetable kingdom. The grand purpose of every plant is to increase itself by seeds, by offsets, or by tuberous processes proceeding from the roots, which also may be called offsets, as in fact they are. A great majority of plants reproduce themselves by seed only; many by suckers or offsets, and also by seeds; and a third description perpetuate themselves by offsets, living germs on the stems or leaves, and at the same time by seeds also.

Now by long experience it has been found that, if plants be prevented from producing progeny in any particular way to which they are naturally prone, they will make a stronger effort to increase themselves by some other way. If, for instance, a bulb be prevented flowering and ripening seed, it will certainly produce an increased number of offsets; and, contrariwise, were it prevented from producing offsets by repeated examination to destroy them, the seeds would be thereby much increased, and sooner matured.

This law of nature may be taken advantage of in many more ways, in bringing about practical results, perhaps, than have yet been thought of. We were very much pleased, some time ago, to hear how the senior Mr. Harrison (at Petworth we think it was) took advantage of this law of vegetation, to increase and enlarge the tubers of the *Oxalis crenata*. His experienced eye seeing that the tendency of the plant, in our moist climate, was to run too much "to straw," wisely con-

sidered that, by checking this aptitude to produce flowers, he would encourage the production of tubers, determined to cut down or thin the stems, and so obtained the result he expected, viz. an abundant return of tubers. This was an application of science to the practice of gardening which deserves imitation in many other things besides that of the culture of the *Oxalis*. In this instance the treatment was doubly advantageous, as the stems, properly dressed, are as much esteemed as are the tubers.

Any practical expedients which may be adopted on this manageable property of plants may be classed along with the more common and every-day practice of pruning trees, or thinning crops; we destroy or take away a portion, to increase or improve what is left. The fruit-grower improves the size and quality of his crop by judicious and timely thinning; the florist obtains large and handsome blossoms by preferring the principal buds, and banishing every rival on the same stem; and the seed-grower, in many instances, obtains a purer and superior sample of seed by taking a part, rather than the whole, of what may be produced.

This branch of practical knowledge must be often acted on in the management of the grape-vine, as well in the regulation of the shoots as to number, as of the fruit as to quantity. Three shoots from one root, properly treated during their growth, may, in the next year, yield a greater weight of grapes than treble the number of shoots in which the powers of the root would be too much diffused, and consequently neither bunches nor berries of the full size. It is really astonishing how much the powers of a vine may be concentrated, and how unusually large the wood, leaves, bunches, and berries will become, by throwing into a reduced number of shoots the whole vigour of a root. Mr. Hoare's method of pruning vines on open walls is a good exemplification of this practice; and uncommonly fine grapes are produced in vineries, and particularly in pineries, by this treatment of the trees. In the last-mentioned houses the White Muscat of Alexandria, and the Syrian, (when deemed worthy of a place,) are both grown to an immense size of bunches, and berries in proportion. The Syrian is a very inferior fruit as to quality, but it is a magnificent ornament to a table. A harmless device is sometimes practised in order to have an apparently very large bunch, and that is, where two or three bunches show closely together, by stopping the main shoot close to the second or third, and also the intermediate laterals, the bunches, if they set well, will be so close together as to appear like one. Without this device we have seen the Syrian grown to the weight of nine pounds. The flavour of this grape may be much improved, however, (as all

other kinds are,) by being planted in a shallow border of dry materials; but, in this case, neither bunches nor berries will be so large.

The Black Hamburgh grape is a variety that finds its way into every vineyard, and it is remarkable how very susceptible the bunches and berries of this sort are of enlargement by the means above alluded to. Pruning thinly to engross the shoots, allowing one bunch only to each young shoot, and one dozen berries, or less, on each bunch, brings the berries to the size of Orlean plums. The same means effect the same result on all other kinds of fruit, and other productions, where a plurality are produced together.

ON THE CONSTITUTION AND FUNCTIONS OF BULBS.—Our attention has been particularly drawn to this subject, at this time, by an excellent paper on the vegetation of the bulbs or tubers of the *Crocus*, by Dr. Augustus Trinchinetti, in the last number of "The Gardener's Magazine;" one of the best communications on the constitution and development of tuberous bulbs that ever has been published.

It is well known that the great Linnæus considered bulbs as underground buds—a very good definition, because, as a bud in its evolution exhibits a stem, and leaves, and flowers, and fruit, so does the bulb do the same, but with this difference, that, whereas the stem of a bud is persisting, that of a bulb or tuber is fugitive, and annually perishable.

From the time of Grew down to the present day, it does not appear that the manner of the development of bulbs or tubers has been much studied. That they have been dissected and figured, for the sake of giving them proper names, has been done by many former writers; but no one has entered into the minutia of the development as has been done by Dr. Trinchinetti.

"The bulb of the *Crocus sativus*, examined in its dormant state, consists of a parenchymatous starchy substance, which forms a flattish globular body, surrounded by dry loosely-fibered coats, succeeding each other like scales, and forming funnels placed one within the other, and gradually decreasing in size, which can be easily separated, but which are all attached at their base. If you take away these membranous funnels, you will find a solid whitish bulb within them, somewhat compressed [depressed] in the upper part, and marked horizontally with circular lines, which are nothing more than the bases of the membranous funnels, or coats, which have been thrown off by the bulb, or taken away from it. In the centre of the upper part of this bulb, or near the centre of it, there are three, or sometimes even more, cones, formed of finer funnel-shaped coats, under each of which appears a small

tubercle—that is, the germ of the offset, or new bulb, intended to be developed in the next growth. There are also various marks scattered all over the bulb, without regular order, and of different sizes, formed of very fine coats, and containing small germs, which are developed according to the quantity of nourishment received by the parent bulb, and which sometimes may, perhaps, become abortive, when the parent bulb is too small to afford them support.

“The bulb, if cut open in this dormant state, only presents a homogeneous milk-white mass, the organisation of which is invisible. When it begins to vegetate it sends out circumferential fibrous roots, and developes one or more germs, which increase into one or more little bundles, each formed of a sheath, enclosing leaves, and the largest containing also the flower. These little bundles have a slight expansion at the base, which, being cut through lengthwise, discover a smaller bulb surrounded by coats, the outer of which proceed from the sheaths above mentioned, and the inner ones from the bases of the leaves, and both, combined, forming a small solid substance.”

This small solid substance ultimately becomes the new bulb to flower in the following year. Dr. T. has traced the whole process of the change presented by the old bulb while it is nourishing its leaves, flower, &c., and at last feeding off its successor, while the parent itself dwindles away to a small mass of dead fibres.

In the case of real bulbs, as the tulip, for instance, we find it, before expansion, to consist of what is called the radical plate, on which are seated a congeries of thick fleshy scales, involving each other, and embracing the embryo flower and leaves in the centre. When this latter portion is developed in the summer, a successor rises from the radical plate close beside it, to take the place of the first, which totally disappears at the end of the flowering season; thus showing that all the succession-bulbs originate in the radical plate.

Considering, then, what Dr. T. has shown relative to the structure of the crocus tuber, it is evident that, in the first stage of its development, it acts like a radical plate, but with this difference, that, whereas the crocus tuber wastes entirely away, the plate of the tulip is permanent, suffering no diminution, except the bottom slough, which is discharged along with the fibres which served to draw nourishment during the growth.

Dr. T. observes that the tubers of the *Gladiolus communis* are renewed much in the same way as those of the crocus. The *Colchicum autumnale* also differs but little from the crocus, only that, instead of the new bulb being produced on the crown of the old one, it is produced at the side, and, “having a free base, they immediately, without passing through

the main bulb, send down capillary roots, which thus probably perform the office of the fusiform roots produced by the crocus."

Concerning these fusiform roots we may observe that, if the *Crocus sativus* sends down such processes constantly, it is not so with other species of that genus, except under peculiar circumstances; for we have noticed that, if any of the common garden sorts, standing long in the same place, get too near the surface, from the manner of increasing their bulbs, one every year above the former, they, near the surface, have the power of sending down a fusiform process, with a new bulb or tuber at the extremity, to take a deeper station in the soil. The same circumstance is exemplified in some of the wild tulips, particularly the *T. repens*. Many, if not all the British *Orchidæ*, the *Erythronium dens-canis*, &c., invariably produce their new tubers from the side of the old one.

"The *Fumaria bulbosa* of Linnæus (*Corydalis bulbosa* of Decandolle) has also some analogy with the crocus, and other plants, in the mode of reproducing its bulbs or tubers, whichever they may be called. In its dormant state it presents a white starchy mass, which contains an olive-shaped substance, situated vertically in its centre, with its broadest end downwards, which is of a yellowish colour, and of a slightly fibrous structure. When the bulb begins to grow, the roots proceed from the lowest part of the olive-shaped substance, and, at the same time, one or more shoots rise from the upper part, which continue to grow and produce flowers. When the old tuber has done growing, the offsets begin to be developed; and, as it has been observed that they are always in the centre of the parent bulb, and as that is exactly the spot occupied by the olive-shaped substance, it may be inferred that the offsets have their origin in it. As the offsets increase in size, the substance of the parent tuber diminishes, till, by degrees, it changes into a spongy involucre, which, by being continually pressed by the new ones, is soon reduced to a membrane, and then disappears. As soon as the new bulbs are completely formed, the roots and the stems of the old tuber fall off, and the new ones remain in a dormant state till the next season of vegetation."

We feel not a little proud that the investigations of the learned Dr. Trinchinetti accord so nearly to what we ourselves published on the same subject several years ago. As proof, we may be excused for quoting the two following paragraphs:—

In describing the tulip, we have stated that it may be taken as "a type of the bulbous-stemmed plants, and may be described, in its perennial character, as being constitutionally composed of an indefinite assemblage of vital entities, each of which is a perfect plant, consisting of

fibrous roots, leaves, stem, flower, and seed, and which, when the last is ripe, wholly dies. This assemblage of gems, or germs, (latent or invisible principles of buds or flowers,) are seated and crowded together on or in what is called the radical plate, which appears to be constituted like the ovary of an animal, whence they are successively developed, either in the order of their seniority or of their position. The highest or oldest of the train developed this year is succeeded by the second of the series in the next, and so on, barring accidents, for ever." Again:—

"The radical plate is a depressed cone of dense cellular matter, in which the incipient gems lie invisibly embedded. It always appears as the base of the largest division of the bulb, and the nucleus or source whence all gems, whether primary or secondary, successively issue, without any notable diminution thereof. Under a common microscope its substance is uniform—not visibly granular, as might be expected; the parts composing it being so blended together, that they cannot be distinguished till they are resolved into principals, or discharged as offsets. From the under surface of the radical plate, and particularly from the edges, the roots come forth, appearing to belong only to the superior gem or division which is in the act of expansion, because, as already observed, they are developed and decay together. The next year's division is furnished with roots of its own, and has no dependence on those of its predecessor, they being very attenuated, and only annual."

An attentive reader cannot fail to observe the accordance between the description of the physical constituents and evolutions of the crocus by Dr. T., and our own account of the constituents and perennial development of the tulip. They throw light on each other, and render *the last* of more value than it was, by many, considered to possess.

Dr. Trinchinetti's opinion concerning the use which nature intends the bulbs to answer is well worth transcribing.

"Linnaeus," says Dr. T., "considered bulbs as hybernacula—that is, as winter storehouses, or bodies intended to preserve the germ of the future plant while vegetation is at rest, and to administer with their own substance its first nourishment, as the seed does to the embryo with the albuminous matter which it contains in its cotyledons.

"Nobody can doubt that bulbs were intended both to preserve and to nourish the germ; but, if they were formed for these purposes only, why do they continue during the life of the plant, contrary to the habit of the buds on the branches of trees, and of the albuminous matter contained in the cotyledons of seeds, which, soon after the bud or young plant has been developed, disappear, or at least change their nature?

Why are they, though they slowly diminish in bulk, preserved during all the course of vegetation? and why do they not perish, like the leaves? These reflections induced me to think that the bulb must have some important function to perform during the whole life of the plant, no part being given by nature without an intention."

After detailing several incidents which occurred during the Doctor's investigations, he arrives at the following conclusion, viz. "that solid bulbs or tubers are masses of starchy matter, provided by nature to serve as a support to the young plant, in the same manner as the albumen of the egg serves to nourish the chicken.

"Whether scaly bulbs and tubers are destined by nature to perform the same office I have not yet had sufficient experience to determine; but as they contain a mucilaginous or starchy substance, and have all the delicacy of texture mentioned; and as I have observed that the onion, while kept out of the ground, germinates, and continues to grow till it has reduced the bulb to a congeries of withered coats; that the *Scilla*, in a similar situation, will even flower; and that the tubers of the potato put out shoots, and nourish them for some time; I think," continues the Doctor, "it may be admitted, that not only solid bulbs, but also those that are scaly, are intended to nourish the plant with their substance."

It is to be hoped that Dr. T. will continue his investigations on the structure of all the varieties of bulbs, tubers, and other gross or fleshy roots; he has the acumen of a philosopher, and no doubt his illustrations of the constitution, development, and reproduction of these curious vegetable bodies, would be a welcome addition to our present stock of botanical knowledge.—ED.

VEGETABLE PHYSIOLOGY.—This is a favourite topic with us; and, as it is a subject on many points of which considerable doubts are entertained, we, according to promise, feel it a duty to present our readers with extracts from the best authors who have written on this branch of botanical science, in order that they may be able, while observing the phenomena, to judge for themselves how far the published accounts and opinions agree with their own observations.

The following are extracts from Dr. Lindley's "Introduction to Botany," first edition, (a second having been recently published;)—a book which not only contains all the knowledge acquired by its talented author, but also the marrow of all that was previously published by every botanical authority on the continent and elsewhere. Concerning the "elementary organs," the Doctor proceeds:—

"Of these, the cellular tissue is the most important, as is apparent

by its being the only one of the elementary organs that is uniformly present in plants, and by its being the chief constituent of all those compound organs that are most essential to the preservation of the species.

"It transmits fluids in all directions. In most cellular plants no other tissue exists, and there a circulation of sap takes place; it constitutes the whole of the medullary rays, conveying the elaborate juices from the bark towards the centre of the stem. All the parenchyma, in which the sap is diffused upon entering the leaf, and to which it is exposed to evaporation, light, and atmospheric action, consists of cellular tissue; nearly all the bark, in which the descending current of the sap takes place, is also composed of it; and in indigenous plants, where no bark exists, there appears to be no other route that the descending sap can take than through the cellular substance, in which the vascular system is embedded;—it is, therefore, readily permeable to fluid, although it has no visible pores.

"In all cases of wounds, or even of the development of new parts, cellular tissue is *first generated*. For example: the granulations that form at the extremity of a cutting when embedded in earth, or on the lips of incisions in the wood or bark; the extremities of young shoots; scales, which are generally the commencement of leaves; pith, which is the first part created when the stem shoots up; nascent stamens and pistilla; ovula; and, finally, many rudimentary parts: all these are at first, or constantly, formed of cellular tissue alone.

"It may be considered *the flesh of vegetable bodies*; the matter which surrounds and keeps in their place all the ramifications or divisions of the vascular system is cellular tissue. In this the plates of wood of exogenous plants, the veins of leaves, and, indeed, the whole of the central system of all of them, are either embedded or enclosed.

"The action of impregnation appears to take place exclusively through its agency. Pollen is only cellular tissue in a particular state; when it bursts the vivifying particles, it contains a still more minute state of the same tissue; the coats of the anther are composed entirely of it; and the tissue of the stigma, through which impregnation is conveyed to the ovula, is merely a modification of the cellular. The ovula themselves, with their sacs, at the time they receive the vivifying influence, are a semi-transparent congeries of cellules.

"It is, finally, *the tissue in which alone amylaceous or saccharine secretions are deposited*. These occur chiefly in tubers, as in the potato and arrow-root; in rhizomata, as in the ginger; in soft stems, such as those of the sago, palm, and sugar-cane; in albumen, as that of corn;

in pith, as in the Cassava ; in the disc of the flower, as in *Amygdalus* ; and in bark, as in all exogenous plants ; and cellular tissue is the principal or exclusive constituent of these.

"*Woody fibre* is apparently destined merely for the conveyance of fluid upward or downward, from one end of a body to another, and for giving firmness and elasticity to every part.

"The real nature of the functions of the *vascular system* has been the subject of great difference of opinion, and may, indeed, be said to be so still. *Spiral vessels* have been most commonly supposed to be destined for the conveyance of air ; and it seems difficult to conceive how any one accustomed to anatomical observations, and who has remarked their dark appearance when lying in water, can doubt the fact. Nevertheless, many authors, and among them Dr. Dutrochet, assert that they serve for the transmission of fluids upward from the roots. This observer states, that 'if the end of a branch be immersed in coloured fluid, it will ascend in both the spiral vessels and ducts ; but that, in the former, it will only rise up to the level of the fluid in which the branch is immersed ; while, through the latter, it will travel into the extremities of the branches.' It has, however, been asked with much justice, 'How the opinion that spiral vessels are the sap vessels is to be reconciled with the fact of their non-existence in multitudes of plants in which the sap circulates freely ?' To which might have, or perhaps has been, added the questions, 'Why they do not exist in the wood, where a movement of sap chiefly takes place in exogenous trees ?' and also, 'How it happens that their existence is almost constantly connected with the presence of sexes, if they be truly sap-vessels ?' And, further, it has always been remarked, that if a transverse section of a vine, for instance, or any other plant, be put under water, bubbles of air rise through the water from the mouths of the spiral vessels. But then it has been urged that coloured fluids manifestly rise in the spiral vessels ; a statement that has been admitted, when the spiral vessels are wounded at the part plunged in the coloured fluid, but denied in other circumstances. Indeed, to any observer acquainted with the difficulty of microscopic investigations, the obscurity that practically surrounds a question of this sort must be apparent enough."

Dr. Bischoff is quoted by Dr. L. as having come to the following conclusion concerning the functions of spiral vessels, viz.:—"That plants, like all other living bodies, require, for the support of their vital functions, a free communication with air ; and that it is more especially oxygen which, when absorbed by the roots from the soil, renders the crude fluid fit for the nourishment and support of a plant,

just as blood is rendered fit for that of animals. But, for this purpose, it is not sufficient that the external surface should be surrounded by the atmosphere; other aëriferous organs are provided, in the form of spiral vessels, which are placed internally, and convey air containing an unusual proportion of oxygen, which is obtained through the root, by their own vital force, from the earth and water. In a hundred parts of this air, twenty-seven to thirty parts are of oxygen, which is in part lost during the day by the surface of plants, under the direct influence of the solar rays."

Dr. L. adds—"So that while true spiral vessels may be admitted as undoubted vehicles of air, ducts of all kinds, and especially dotted ducts, cannot be doubted to be the passages through which fluid is conveyed, when great rapidity is required.

"*Of the Root.*—It is the business of the root to absorb nutriment from the soil, and to transmit it upwards into the stem and leaves, and also to fix the plant firmly in the earth. Although moisture is, no doubt, absorbed by the leaves of all, and the stems of many, plants, yet it is certain that the greater part of the food of plants is taken up by the roots, which, hence, are not incorrectly considered vegetable mouths.

"But it is not by the whole surface of the root that the absorption of nutriment takes place; it is to the spongioles almost exclusively to which that office is confided; and hence their immense importance in vegetable economy, the absolute necessity of preserving them in transplantation, and the certain death that often follows their distraction. . . . Forest trees, with very dense umbrageous heads, do not perish of drougt in hot summers or dry situations, when the earth often becomes mere dust for a considerable distance from their trunk, in consequence of their foliage turning off the rain. The fact is, obviously, that the roots near the stem are inactive, and have little or nothing to do as preservers of life, except by acting as conduits while the functions of absorption go on through the spongioles, which, being at the extremities of the roots, are placed beyond the influence of the leafy canopy, receive the principal share of the rain shed off by the head; and, as the roots are always spreading farther and farther from the main stem, they are continually entering new soil, the nutritious properties of which are unexhausted.

"It is generally believed that roots increase *only* by their extremities, and that, once formed, they never undergo any subsequent elongation. It is probable that this peculiarity may be universal in exogenous plants; but it certainly is not constant in indigenous plants; and I doubt very much whether it be not confined to roots with a woody

structure. Occasionally roots appear destined to act as reservoirs of nutriment, on which those of the succeeding year may feed when first developed, as is the case in the Orchis, the Dahlia, and others ; but it must be remarked that the popular notion extends this circumstance far beyond its real limits, by including, among roots, bulbs, tubers, and other forms of stems.

"By some botanists, and among them M. Decandolle, it has been thought that roots are developed from special organs, which are to them what leaf-buds are to branches ; and this function has been assigned to those little glandular swellings so common of the willow, called *lenticular glands* by Guettard, and *lenticelles* by Decandolle.

"*Of the Sap.*—For the sustenance of plants a fluid is necessary, which is absorbed by the roots from the earth, then sent upwards into the stem, afterwards impelled into the leaves, whence it descends through the liber, transferring itself to the inmost parts of the wood. This fluid, which constitutes the blood of plants, is called the sap. When first introduced into the system, and even when altered in some degree by having dissolved the various substances it encounters in its passage, it is *true sap* : afterwards, when its nature has been more changed by elaboration in the leaves, it becomes what is called the *proper juice*.

"If the sap be examined in its most simple state, it will be found to consist of water, mucilage, and sugar. As the two last can scarcely have been absorbed directly from the earth, it is inferred that, as soon as the fluids taken up by the roots enter the system, they suffer some chemical decomposition, the result of which is the production of mucilage and sugar. In addition to the supply of sap which is obtained by the roots, a certain quantity is, no doubt, also absorbed from the atmosphere by the leaves, as is evident from succulent plants, which will continue to grow and acquire weight long after their roots are severed from the earth. This absorption, on the part of the leaves, chiefly takes place during the night, or in cloudy weather ; while perspiration, on the other hand, goes on in the day-time in bright weather.

"With regard to the chemical nature and changes of the sap, I cannot do better than give the statement of Link, with some necessary alterations. '*The food of plants must be composed of oxygen, hydrogen, carbon, and azote.* Water consisting of oxygen and hydrogen alone is not sufficient. Many experiments, indeed, have been instituted to prove that pure water is a sufficient food, especially by Van Helmont, Eller, Bonnet, Du Hamel, and others ; but it is probable, as Walerius has inferred, that the water out of which plants are formed

already contains the necessary chemical principles. To this it is objected that plants grown in water alone never arrive at perfection, or mature their seeds. But this is not strictly true; they do perfect their seeds: but it is not surprising that crude water should be insufficient for purposes which are fully answered by water properly mixed and tempered.'

"That the extractive matter contained in earth was the real food of plants was long ago stated by Woodward and Kylbel; and most physiologists have adopted this opinion. But it has been estimated that a plant, when dried, does not derive more than a twentieth part of its weight from extractive matter and carbonic acid dissolved in water. Now, supposing this calculation to be not far from the truth, it serves to show that extractive matter and carbonic acid are not alone sufficient for the nutriment of plants.

"Nevertheless, if neither extractive matter nor carbonic acid can be considered to constitute exclusively the food of plants, it is at least quite certain that they not only cannot exist without the latter, but that it forms by far the greater part of their food. It is well known that roots cannot perform their functions unless within the reach of the atmosphere. This arises from the necessity for their feeding upon carbonic acid, which, after having been formed by the oxygen of the atmosphere combining with the carbon in the soil, is then received into the system of the plant, to be impelled upwards, dissolved in the sap till it reaches the leaves, where it is decomposed by light, the oxygen liberated, and the carbon fixed. It has also been ascertained that, feed plants as you will, they will neither grow nor live, whether you offer them oxygen, hydrogen, azote, or any other gaseous or fluid principle, unless carbonic acid be present.

"*The course which is taken by the sap*, after entering a plant, is the next subject of consideration. The opinion of the old botanists was, that it ascended from the roots between the bark and the wood; but this has been long disproved by modern investigators, and especially by the experiments of Mr. Knight. If a trunk be cut through in the spring, at the time the sap is rising, this fluid will be found to exude, more or less, from all parts of the surface of the section, except the hardest heart-wood, but most copiously from the alburnum. If a branch be cut through at the same season, it will be found that, while the lower face of the wound bleeds copiously, scarcely any fluid exudes from the upper face; from which and other facts it has been fully ascertained that the sap rises through the wood, and chiefly through the alburnum. Observations of the same nature have also proved that the sap *descends through the liber*. But the sap is also diffused late-

rally through the cellular tissue, and this with great rapidity, as will be apparent upon placing a branch in a coloured infusion, which will ascend and descend in the manner just stated ; and will also disperse itself laterally in all directions round the principal channels of its upward and downward route.

“ *With regard to the vessels through which* this universal diffusion of the sap takes place; it has already been stated that its *upward* course is always through the woody fibre, and probably also through the ducts; and that it passes *downwards* through the woody fibre. But there can be no reasonable doubt that it is also dispersed through the whole system, by means of some permeable quality of the membranes of the cellular tissue, which is invisible to our eyes, even aided by the most powerful glasses. It has also been suggested that the sap finds its way upwards, downwards, and laterally through the intercellular passages, which exist at the points of union of every individual elementary organ. That such a channel of communicating the sap is employed by nature to a certain extent I do not doubt, especially in those plants in which the intercellular passages are large ; but whether this be an universal law, or has only a partial operation, is quite unknown, and is not, perhaps, susceptible of absolute proof.

“ *The accumulation of sap* in plants appears to be attended with very beneficial consequences, and to be deserving of the especial attention of gardeners. It is well known how weak and imperfect is the inflorescence of the turnip tribe, forced to flower before their fleshy root is formed, and how vigorous it is after that reservoir of accumulated sap is completed. Mr. Knight, in a valuable paper on this subject, remarks, that the fruit of melons, which sets upon the plant when very young, uniformly falls off ; while, if not allowed to set until the stem is well formed, and much sap accumulated for its support, it swells rapidly, and ripens well. In like manner, if a tree is by any circumstance prevented bearing its crop one year, the sap that would have been expended accumulates, and powerfully contributes to the abundance and perfection of the fruit of the succeeding year.

“ *The course of the motion of the sap* is a subject which has long excited great curiosity, and has given rise to numberless conjectures. It was for a long time believed that there was a sort of circulation of the sap of plants to and from a certain point, analogous to that of the blood of animals ; but this was disproved by Hales, and is not now believed. This excellent observer thought that the motion of the sap (the rapidity of which he had found to be greatly influenced by the weather) depended upon the contraction and expansion of the air,

which exists in great quantities in the interior of plants. Others have ascribed the motion to capillary attraction ; and Du Petit Thouars suggests that it arises thus:—‘ In the spring, as soon as vegetation commences, the extremities of the branches and buds begin to open. The instant this happens, a certain quantity of sap is attracted out of the circumjacent tissue for the supply of these buds ; the tissue which is thus emptied of its sap is filled constantly by that beneath or about it ; this is in its turn replenished by the next ; and thus the mass of fluid is set in motion, from the extremities of the branches down to the roots.’ Du Petit Thouars is, therefore, of opinion that the expansion of the leaves, &c., is not the effect of the motion of the sap, but, on the contrary, the cause of it ; and that the sap begins to move at the extremities of the branches before it stirs at the roots. That this is really the fact is well known to foresters, and all persons accustomed to the felling or examination of timber-trees in the spring.”

OBSERVATIONS ON THE NATURE AND REAL CHARACTER OF THE BARK OF TREES.—The bark is an exterior membrane, which, after being exposed for some time to the atmosphere, becomes indurated into a dense covering, protective of the more delicate membranes within. The first-formed layer of bark, or cuticle, as it is sometimes called, receives annual additions of liber to its inner surface, and thereby thickening it from year to year as long as the tree lives. But this process proceeds with very different degrees of celerity ; the liber of some trees is remarkably thin, appearing like a tissue of the finest gauze—as the beech ; others like coarse lace—as the lime ; and that of the cork-tree so thick and fungous, that it may be stripped off the tree every seventh or eighth year, and of sufficient thickness for the manufacture of corks.

As the growth of bark takes place from within, it happens that, in order to make way for the internal accumulation, the outer layers must necessarily be so constituted as to give way somehow to permit the internal increase. This is effected in various ways:—the bark of oak, elm, and many other kinds of exogenous plants, yields to the swelling membranes by splitting perpendicularly, the openings every year becoming wider and deeper. That of the birch is split perpendicularly, and into very rugged pieces on the lower part of the trunk ; but on the higher parts of the branches it is thrown off in horizontal fillets, like ribbons. The bark of the beech, and several other smooth-barked trees, is stretched horizontally, but without fracture or dismemberment of the exterior surface ; while that of the grape-vine is thrown off in narrow

slips longitudinally; and the platanus and others ease their swelling stems of an useless encumbrance by discharging their oldest bark in broad flakes, as is so visible at this season of the year.

All these instances show that the bark has only a temporary agency in the system, and that, in fact, it is only an excrementitious product of the plant. In the early stages of its growth it assists in the conduction of the sap, and continues so to do for perhaps three or four years—longer or shorter, however, according to the specific character of the bark itself. The bark of a beech, an orange, or a fig tree, is very different from those of the oak, the Dutch elm, or the cork trees; the former are thinner, more compact in texture, and remain longer serviceable as active members of the system, than the barks of the latter, which are grosser in consistence, and more fugitive.

Under certain circumstances of soil or situation, the bark of both fruit and forest trees is not naturally rent nor distended enough to allow of free or perfect growth, and consequently cramps the healthy expansion, and causes a stagnation of the juices inimical to the well-being and fruitfulness of the trees.

That this defect, to which all trees are liable, admits of a practical remedy, has been already shown (see page 416, vol. iv.); so that it is unnecessary to advert to it again in this place, except to recal attention to the fact, and to regret that it is not so generally understood nor so much practised as it should be.

Specimens of cork-trees in this country, though they attain the height of thirty or forty feet, would, we are certain, be much benefited by having all their old bark stripped off; it would induce a renewed vigour, and prompt the hide-bound exotics to acquire greater magnitude of bole, and greater extent of branches, and, moreover, enlarge the foliage; making the trees more ornamental, which old cork-trees very seldom are, in consequence of the diminutive size and tarnished appearance of the leaves.

Other exotic trees having a watery sap, such as some of the American oaks, may, no doubt, be much encouraged in growth by paying attention to the state of their bark, in not suffering it to become injuriously hardened and unhealthy.

HAWKERS OF ORNAMENTAL PLANTS.—It is astonishing to witness what great numbers of poor industrious people gain a livelihood by hawking flowering plants in baskets through the streets of London. These intermediate dealers keep employed a considerable portion of the capital, and a good many of the hands, of the London nurserymen. The favourite plants of the basket-retailers are those having the attrac-

tion of high colour, such as cockscombs and the like. One of the most fashionable, at present, is the *Kalosanthes splendens*, of which as fine specimens may be seen in the streets as ever graced a conservatory. All the gayest-flowering pelargoniums and double-flowered myrtles, hydrangeas, balsams, heaths, tiger lilies, &c. &c., are plentiful.

The prime cost varies from sixpence to half-a-crown; but the retailers chiefly barter them away for cast-off or faded garments of any kind, particularly those which have been worn by ladies; so that every lady of taste may every year furnish her windows or balcony with the gayest flowers at a very cheap rate.

It is wonderful what a change and general love of flowers have been created by this mean and laborious kind of traffic; for it may be observed that there is scarce a parlour window to be seen that is not decorated more or less with beautiful flowers, obtained, perhaps, for a pair or two of old slippers, a shapeless bonnet, or a tattered dress. We mention these trifles merely for the purpose of showing how much commercial men depend upon a grade of auxiliaries which they would hardly acknowledge as such. We have heard of a florist who clears between two and three hundred pounds per annum from off an acre and a half of ground, and who cares not whether he ever sees other customers than the "basket-women" and purveyors of bouquets! But this traffic, small as it is, furnishes abundant proof that the love of flowers is on the increase among us, and, moreover, evinces an advance in mental refinement, which every friend to floriculture must rejoice to see.

The same order of venders are also fruiterers, or itinerant green-grocers, when the season for gay flowers is over, and thereby earn a very fair living—in fact, realise a higher per centage upon their capital employed than do the producers of the fruit and flowers.

NOTICES OF BOTANICAL PUBLICATIONS.

EDWARDS'S BOTANICAL REGISTER, continued by Professor Lindley. The September number contains:—

1. *Gilia tenuiflora*. Slender-flowered *Gilia*. A hardy annual, raised from Californian seeds in the garden of the Horticultural Society, where it flowered, for the first time, in August, 1834. A single plant only was at that time raised, but it seeded plentifully, and is now not uncommon.

It is altogether a very attenuated plant, and will make no great show in the flower-border; but the flowers, small as they are, will bear

inspection. The petals are rose-coloured, having a violet-coloured spot at their bases. The flowers are pentandrous, and the genus stands in the natural order *Polemoniaceæ*.

2. *Cirrheæ tristis*. Sad-coloured Cirrhæa. A very pretty-flowering orchideous plant, introduced from Mexico by Messrs. Loddiges, in whose hothouse it flowered in June, 1835, whence the drawing was taken. The leaves spring from furrowed bulb-like appendages, from the base of which the roots and scape come forth. Like its other botanical allies, it grows upon the branches of trees, and apparently in a pendulous manner, like many others of the tribe. Like other dark-coloured flowers, it is deliciously fragrant, and deserves a place in every collection of *Orchideæ*.

3. *Cratægus spatulata*. Spatula-leaved Thorn. "There can be no doubt," says Dr. Lindley, "but that this plant, the *C. virginica* of the nurseries, is the real *C. spatulata* of Michaux, about which so little is known." In Mr. Loudon's new work (*Arboretum et Fruticetum Britannicum*), the old, or rather the common, name is retained, as he considers the *C. microcarpa* figured in a former number of the Botanical Register as the true *C. spatulata*.

This species has very much the appearance of *C. parvifolia*, from which it is essentially distinguished by its leaves being edged with strong dark glands, and by its large leafy stipules. The fruit is always green, even when ripe; is a little downy, and contains from five to six stones.

4. *Lupinus latifolius*. Broad-leaved Lupine. This lupine has been described by Dr. J. G. Agardh, in the valuable little work entitled *Synop. Gen. Lupin.*, written by that learned botanist. Dr. Agardh has described seventy-six certain species of this pretty genus, besides adverting to seven others of which little is known. Of the former, thirty-four are in Mr. Douglas's collection. It is a hardy perennial, flowering in July and the two following months.

5. *Ardisia odontophylla*. Tooth-leaved Ardisia. A stove shrub, belonging to the natural order *Myrsinaceæ*; a native of Bengal, where it was found by Dr. Buchanan, and by Dr. Wallich's collectors.

It was first introduced by T. C. Palmer, Esq., of Bromley, by whom it was communicated to Mr. Knight, of the King's Road, Chelsea, in whose hothouse the figure was made, in July, 1834.

Independently of its being, like all the Ardisias, a handsome ever-green, this species is remarkable for its delicious fragrance. Its flowers are pale salmon-colour, slightly streaked with red.

6. *Antirrhinum glandulosum*. Glandular Snapdragon. This, if

not a very pretty plant, is something of a geographical curiosity, it being the first species of the genus *Antirrhinum* which has yet been found certainly wild in the New World. The specimens of *A. orontium* that have been met with in the United States are believed to have been introduced from Europe.

Seeds of it were sent to the Horticultural Society from California by Mr. Douglas. The flowers were first produced in 1815; they appear in August and September, and continue to open till the frosts come. The species is quite a hardy annual, and will grow in any soil; it ripens its seeds freely.

7. *Yucca draconis*. Dragon-tree-leaved Adam's Needle. What may be species, and what varieties, in this noble genus, it is, in the present state of botanical information, impossible to say; there is, however, but little doubt that the two plants which form the subject of the plates are really distinct.

"This, which I presume," says Dr. Lindley, "is the *Yucca draconis* of Haworth and Elliot, at least, whatever it may be of others, is one of the most stately of the genus; it grows along the sea-shore of Carolina, frequently mixed with *Y. gloriosa*, and flowers from May to August; it sometimes grows as much as nine or ten feet high. The great peculiarity by which it is distinguished is the spreading flowers, whose segments, instead of remaining closed in a globose manner, as in most others, expand till they diverge from the flower-stalk at nearly a right angle.

In the nursery of the Messrs. Backhouse, of York, it stands and flowers well in the open air, along with *Y. rufocinata*, *recurvifolia*, *glaucescens*, *filamentosa*, and others. In the garden of the Horticultural Society no weather seems to hurt them.

8. *Yucca flaccida*. Weak-leaved Adam's Needle. Of this the native country is unknown. It was first noticed in the garden of Mr. Vere, of Kensington Gore, where it had been probably raised from North American seed. It is a pretty and apparently distinct species, well marked by its thread-edged scabrous leaves, pallid flowers, and stemless habit.

The plant is a hardy evergreen perennial; its flowers are over by the middle of August, and it is easily propagated by offsets. Dr. Lindley thinks the whole tribe are maritime plants, delighting in a loose sandy soil, and recommends them to be cultivated near the sea-coast.

SWEET'S BRITISH FLOWER-GARDEN, continued by Professor Don. The September number contains:—

1. *Allium siculum*. Sicilian Garlic. This, like the rest of the

onion tribe, is hexandrious, and belongs to the natural order *Asphodeliæ*. It is a remarkable species, and grows abundantly in the shady valleys of Madonia, a mountain thirty-five miles south-east of Palermo. The plant occurs in other parts of Sicily. Although accurately represented by Boccone and Cupani, it remained unnoticed by modern botanists until recently taken up by Ucria, who has given it the specific name of *siculum*.

The plant may perhaps be thought deserving of being separated from *Allium*, on account of the cells of its capsule being polyspermous; a character which it has in common with *A. inodorum*; but the umbellate inflorescence, persistent perianthium, the habit and peculiar odour of the plant, accord entirely with *Allium*. The drawing was taken from a living specimen in the Botanic Garden, Chelsea, where it was raised from seed four years ago. The scent is more powerful and disagreeable than that of any other species.

2. *Berberis empetrifolia*. Crowberry-leaved Barberry. This is a procumbent shrub, with slender, twiggy, angular branches. Like its congeners, the flowers are orange or yellow, hexandrious; and it belongs to the natural order of which the genus is the type, viz. *Berberideæ*.

The plant is said to be a native of the lands bordering the Straits of Magellan, whence it was introduced to the Clapton nurseries by Mr. Anderson, an indefatigable collector for that establishment, who accompanied Captain King on his voyage of survey. The plant was originally discovered by Commerson, and was, previous to its introduction to our gardens, only known from the specimens collected by that enterprising botanist.

The habit of the plant is extremely delicate, and it differs materially from the more common species in bearing single, instead of racemes of flowers.

Several new species of this interesting genus have been lately introduced into our collections; and we hear that the continental nurserymen have two or three which we are yet strangers to. A specimen of one of these we have seen, and, from the vast number of its racemes of flowers, might, with much propriety, be called *floribunda*.

3. *Pæonia albiflora*; var. *Pottsii*. Potts's Chinese Pæony. This is certainly the most splendid of the five varieties of *albiflora* now cultivated in our gardens (there are nine varieties named in Loud. Hort. Brit.). It was introduced by Mr. John Potts, from China, in 1822, and named by Mr. Sabine, in compliment to that zealous collector, who had been sent out by the Horticultural Society, and who died shortly after his return to this country.

This variety is quite hardy, flowers very freely, and requires the same treatment as the other kinds. The splendid crimson colour of the flowers of this variety accords but ill with the specific name; it is, however, only another instance of the impropriety of designating plants by their colour or other fugitive property.

4. *Crocus suaveolens*. Fragrant Crocus. This very pretty vernal crocus is found wild about Rome, and in other parts of Italy, and was first recognised as a distinct species by Professor Bertoloni, from whose elaborate work the specific character is copied. The drawing was made from the collection of the Hon. W. T. Fox Strangways, at Abbotsbury, Dorsetshire.

PAXTON'S MAGAZINE OF BOTANY. The number for September contains :—

1. *Rhododendron chamæcistus*. Ground-cistus Rhododendron. This humble, but very pretty, little plant resembles in growth a *Helianthemum* rather than one of its own genus. It bears, at the extremities of its strongest branches, two or three showy flowers, of a pale pink colour, having a circle of deep pink in the throat of the flower.

It seldom exceeds a few inches in growth, the branches being thickly set with leaves; and though it stands uninjured in the open air, at Chatsworth, it is recommended to be kept in pots set on a frame in winter, and removed to the greenhouse to flower in May and June. It is a native of Carniola, and was first cultivated in this country by the Messrs. Loddiges. It is propagated by cuttings, and belongs to *Rhodoraceæ*.

2. *Dryandra longifolia*. Long-leaved Dryandra. This genus of New Holland evergreen shrubs belongs to the natural order *Proteaceæ*, and is nearly allied to *Banksia*; the leaves are of the same harsh texture, and the manner of inflorescence is not very dissimilar. The figure here given (and it is a most difficult task for an artist to give with precision) was taken from a fine specimen which flowered in the Manchester Botanic Garden some time ago. A mixture of turfy loam, sand, and moor-earth, is the proper compost for them; and they may be increased by cuttings, properly treated.

3. *Rhodanthe Manglesii*. Captain Mangle's Rhodanthe. A very beautiful annual, introduced by Captain Mangles, R. N., from the colony of Swan River, in Australia. Mr. Paxton speaks highly of this plant, not only as a handsome ornament for the flower-garden, greenhouse, or conservatory, but for its accommodating nature in flowering at any season required by the sower. The seed requires to be sown two months or ten weeks before a bloom is wanted; therefore

a sowing every two months will keep up a constant bloom throughout the summer.

4. *Erythrina crista-galli*. The Cockscomb Coral Tree. This plant is one of the most splendid of the order *Leguminosæ*. It is a native of Brazil, where it attains to a tree-like size; and it is one of those tropical plants that, if only defended from frost in winter, will flourish in the open air during our summer. The best compost for them is loam, heath mould, and well-rotted stable-dung. When they cease growing in autumn, cut them down, and place them in a cool greenhouse. About the end of November shift them into fresh soil and larger pots, if necessary, and remove them into a house where the heat is about sixty degrees. Here they will advance, and flower in March. When these flowers fade, cut down and treat as before, and the plants will again flower in July; and, by similar treatment, they may be made to flower once more before Christmas. When growing freely, they should be frequently watered overhead, to keep off the red acarus, which is a fatal enemy. In warm situations out of doors, both this and the *E. laurifolia* will grow and flower freely, but only once in the year; and in the autumn they require cutting down, and to be either well defended from frost where they stand, or taken out of the ground, and kept in a dry cellar till replanting time in the spring.

In addition to the figures and descriptions of the foregoing plants, this number contains:—

A select List of Greenhouse Shrubs, with short notes on their peculiar treatment, together with the colours of the flowers, and the usual seasons of flowering. Also, "Operations" relative to the management and propagation of exotic plants.

SMITH'S FLORISTS' MAGAZINE. The September number contains the following plates, viz.:—

1. *Duchess of Kent Tulip*. A very fine white, feathered with purple. It is above the general size, and is a third-row plant, and may be purchased for two pounds per bulb. Annexed are some Remarks on breaking Tulips, embracing all that is known on the subject, but acknowledging that much uncertainty still prevails in this branch of floriculture.

2. Two fine Carnations, viz. Pugh's "Lady Hill," which was raised from seed by Mr. Pugh, of Abbey Foregate, Shrewsbury, about three years since. "It produces invariably a very large, handsome, and well-formed flower, strongly and definitely marked or ribboned with a most brilliant scarlet on a clear white; the edges of the petals are perfectly entire. It is remarkably constant for so high-coloured a flower;

it scarcely ever runs in colour, the petals being even and fleshy." Mr. P. has a large stock of healthy plants, and intends to let them out this autumn at half-a-guinea the pair.

Hogg's "Colonel of the Blues" is particularly striking; the flower is large, and well flaked with a most brilliant blue purple; the white is also pure, and the whole flower has a beautiful chaste appearance. It is a healthy grower, and produces a good supply of grass. It will be sold out in the autumn of 1837, at one guinea per pair.

3. The third plate exhibits "*Fuchsia Groomiana*," Mr. Groom's *Fuchsia*—a superior and strong-growing greenhouse species or variety of this universally admired genus of plants. In colour it resembles the *Coccinea*; but its superior amplitude of flowers and foliage makes it particularly deserving of a place in every collection.

4. On this plate are represented three of the finest Pinks—namely, "Hogg's Middlesex Beauty, White's Warden, and Unsworth's Omega." These three specimens were grown by Mr. Hogg. His Middlesex Beauty is a very brilliant and attractive object, perfect in form, and free in its growth. White's Warden is a sparkling flower; the dark colour, contrasted with its pure white ground, gives it a peculiar prominence in the pink bed. Unsworth's Omega is a large and well-filled flower; the colour of the lacing is pure and bright: it is certainly a noble and valuable variety.

To these descriptions are added some very good directions for the culture of the *Ranunculus Ariaticus*—so great a favourite of florists. This is subjoined as an appendix to the former numbers of the work; and we are sorry to observe, from the concluding paragraph of this number, that it is to be *the last*. We are, indeed, sorry on two accounts: first, that the indefatigable industry and superior abilities of the author should not have met that encouragement which his exertions so well deserved; and, secondly, because its relinquishment is a proof that the love of flowers, and estimation of their faithful portraiture, are not so prevalent as we conceived such feelings to be.

However, what is thus far published contains a valuable quantity of floricultural information, and quite as much, perhaps, as is required for all practical purposes; and in this view it may be considered a complete work; and, therefore, we can sincerely recommend it to every one seeking information on this pleasing pursuit.

EXTRACTS.

"*Amherstia nobilis*, the *Thoka* of the Burmese, is one of the most splendid vegetables known. When in full leaf and blossom, with its

large pendulous racemes of rich scarlet flowers hanging in profusion from every part of its noble stem, it is indeed superb. It was discovered growing in the garden of a decayed *Kioua*, or religious establishment, in Burmah, about twenty-seven miles from Martaban. Handfuls of the flowers of this tree are presented by the devout as offerings, in the caves, before the images of Buddha." The only account we have of this plant is in the writings of Dr. Wallich, who describes its generic character as follows:—"Calyx bibracteate, four-cleft, and coloured; vexillum obcordate and large; wings wedge-shaped; keel of two small petals; pod stipulate and oblong, many-seeded." We believe this gorgeous plant is not yet introduced into our collections, and should be particularly inquired after by European residents or visitors to Rangoon.

"*Tamarindus Indica*, the Tamarind or Tetul of Hindostan, is a native of Egypt and Arabia, as well as of the East Indies. The date, called *tamar* by the Arabs, being their most common and valuable fruit, other important fruits have been called dates, or *tamars*, likewise, with some distinctive epithet adjoined; hence the one in question received the name of *Tamar-Hendi*, the date of India—whence our word tamarind. Ignorance or neglect of this circumstance led botanists to add *Indica* as the specific name, to a generic one in which the habitat of the plant was already included.

"*Tamar-indus Indica*, the Indian date, is therefore, as Dr. Francis Hamilton has observed, in his 'Commentary on the Hortus Malabaricus,' 'a vile pleonasm,' and the sooner it and some others like it become obsolete in the language of botany, the better. Hence, as there are two species of tamarind—the one growing in the East Indies, and the other in the West—and as the West Indian species is called *T. occidentalis*, *T. orientalis* would be an appropriate distinctive name for the East Indian one.

"The wood of the tamarind tree is heavy, firm, and hard, and is a useful building-timber: but it is for its fruit that the tree is most known and valued. The pods of the tamarind consist, like other pericarps, of three layers or coats, such as are very evident in the plum and the peach; the outer one called the epicarp, the inner one next the seed is the endocarp, and an intermediate one is the mesocarp. In the tamarind the endocarp is very thin; and the pulpy matter for which the fruit is prized is the mesocarp. This pulp contains sugar, with a large proportion of acid matter; both citric and tartaric acids, as well as mallic acid and supertartrate of potash, being found on analysis; and hence the refreshing properties of the fruit, and its medicinal use in fevers. The oriental tamarinds are more pulpy than

the occidental ones; they are also darker in colour; and, being preserved without sugar, are more acid, and better adapted for medicinal purposes, than the West Indian fruit, which is preserved by the addition of a considerable quantity of sugar. The latter, however, form the most agreeable dessert.

"In India a kind of sherbet is made by the natives, by steeping tamarind pulp in water; and, in times of scarcity, the tamarind stones, divested of the skin, which is very astringent, are roasted, and eaten as beans by the poorer people."—*Burnet*.

Tamarind trees, in a wild state, are very common over all the coast of Coromandel. In the absence of palms, they are the most numerous and the highest trees of the jungles. They have short, but very stout, trunks, with a large-spreading head, equal in size to the largest beech trees in England. They bear great quantities of fruit, very little of which is ever gathered by the natives, except from off the lower branches.

With us the tamarind tree is a stove plant, and is propagated by cuttings.

CALENDARIAL MEMORANDA FOR OCTOBER.

KITCHEN GARDEN.—The principal operations in this month in the kitchen garden are, first, to prepare a rich open spot of ground for transplanting out a full crop of early spring cabbage from the seed-bed sown in August. If the seedlings were pricked into nursing-beds in September, they may remain there till near the end of this month before they are transferred to their final stations: and, secondly, to get the earliest crop of cauliflower plants into their winter quarters; a certain number of the largest plants being put under a rank of hand-glasses, and the rest planted in frames, or on narrow beds on warm-lying borders, where they may be occasionally covered in winter.

The first sowings of Charlton peas and Mazagan beans may be put in, on a dry warm border, towards the end of the month: if they survive the winter, they will yield their pods very early in spring. A small piece of Early Horn Carrot may now be sown in a spare frame; or, if on an open sheltered border, and covered during hard frost, will come in for use very early in the next year.

Taking care of the growing crops of cauliflower now coming into use; broccoli, which will require hoeing among and earthing up; celery the same; late-sown spinach hoed out and kept free from weeds; endive blanched, and a good stock of the middle-sized plants put into frames, or planted in dry sheltered places, to be covered with dry leaves in

winter. A good stock of lettuce should now be placed under glass, close under south walls or other place of shelter.

Prepare for taking up potatoes, carrot, parsnip, beet, scorzonera, salsafy, skirret, and Hamburgh parsley, for storing. Finish spawning mushrooms-beds made in September, and make another to succeed the first.

Dig or trench all vacant ground, adding good dressings of dung where requisite, laying the surface rough or in ridges, if the soil be wet or clayey ; but, if light, quite smooth.

FRUIT GARDEN.—Gather fruit as they become fit, on dry days, for storing. Go over the wall-trees once more, to remove unnecessary shoots, and stop all those likely to bear next season. Remove all sorts of fruit-trees and shrubs ; wash them frequently with soap-suds or other liquid, to prevent winged insects laying their eggs on them at this season. Shift potted fruit-trees ; and, if an additional number be required, now is the best time to pot them.

FLOWER GARDEN.—House greenhouse plants, and re-pot such as have been out in the borders for the summer. Use temporary coverings for seedling dahlias, lest night frosts prevent their blooming. Chinese chrysanthemums will also require protection, as, without some fostering care, they will hardly bloom well this hitherto ungenial season. All plants lately propagated by cuttings, layers, or seeds, may be bedded out ; and all projected alterations or improvements in the flower garden and shrubberies made in this month, and the sooner the better. Prepare beds for the reception of bulbs, &c., to be planted in this and the following month, and composts of all kinds for potted plants. Begin pruning shrubs as soon as the leaves are off. Pot roses for forcing, and all other flowering shrubs. Divide overgrown perennials. Sow boxes and pots of mignonette to go into frames ; and place all plants liable to be hurt by frost in places of safety.

COTTAGE ECONOMY.

“ **BEES.**—The hives this month should be weighed, and, after allowance is made for the weight of the hive and bees, an estimate may be formed of the actual quantity of honey. This must be your guide for feeding. Such hives, therefore, as appear weak, ought to be bountifully fed with the syrup—namely, one pint of ale, one pound of sugar, and about half an ounce of salt ; the whole boiled together and

skimmed. When cold, it has the consistence of honey. The covering of hives should now be particularly attended to, not so much for the purpose of keeping them warm, but to keep them dry.

"GARDEN.—All sorts of hardy fruit-trees which have shed their leaves may now be planted. By the end of the month most of the winter-keeping pears and apples will have reached maturity. Should they separate easily from the branch when gently pulled or twisted, they may be considered fit to gather.

"FLOWERS.—This is the best time for planting the tulip, hyacinth, ranunculus, and anemone. Transplant as directed last month. Tie up chrysanthemums, which will now be coming into bloom. Sweep up decayed leaves, and attend to neatness.

"VEGETABLES.—Transplant the cabbage sown in August. Take up carrots and parsnips, and pack them in sand in a dry place. Let all vacant ground be now trenched and manured, and thrown up rough for winter."—*Cot. Manual.*

REMARKS ON THE WEATHER.

THROUGHOUT the whole of September the weather has been unusually changeable, with the wind mostly from the northerly points; hence the temperature has been below that degree necessary for ripening late peaches, pears, and apples. Grapes are plentiful in most places on open walls, but there is no prospect at present of their ripening; still there are hopes that October, and "*the little summer of St. Martin*," may be fine, and productive of results of which, at present, there is little expectation.

The dripping weather has made French beans and late peas more plentiful, and the general crops of potatoes, as well as turnips, have greatly improved. The ground too, from its being so thoroughly saturated with moisture, will be in a good state to receive autumn-planted or sown crops, and also for transplantation of trees, shrubs, &c.

Meteorologists tell us—what is indeed evident to every common observer—that the moisture of the atmosphere increases, and evaporation diminishes, during this month of October; and, by increasing cloudiness, the effect of radiation from the earth is greatly reduced.

It may happen that the latter part of the autumn may be drier and finer than the beginning; and this we predict merely because, after a long wet time, there usually follows a corresponding dry season.

Sept. 24, 1836.

PAXTON'S
HORTICULTURAL REGISTER,
NOVEMBER, 1836.

HORTICULTURE.

ON THE SHANKING OF GRAPES.

BY G. STAFFORD, GARDENER TO R. ARKWRIGHT, ESQ.

SIR,—In page 330 of your Register, the writer of a very valuable paper on the "Shanking of Grapes" expresses a wish that I should state my opinion on the subject. I first gratefully thank him for his kind, and I hope merited, expression; for, from the manner in which I now proceed in my culture of grapes, I have little to fear from this malady: but, in reality, I am as much at a loss to state or lay down a certain preventive as I was forty years ago; nor do I think that there exists a practical gardener in these realms that will presume to do so. All that they can at present do, is to imitate the intelligent "*A. L. A. T.*" in making public the result of their experience, from which much good may accrue. In a valuable paper furnished by Mr. Ayres, in the Register, he wished that every practical gardener would state his opinion on the subject, well knowing at the time that the task was not a trivial one. Mr. Ayres was, to my knowledge, brought up where every facility was at hand to acquire a knowledge of every particular relating to the vine, but still leaves the subject for his older friends.

In the first place, I think it impossible that the disease can be caused by the condensed water upon either the leaves or bunches; for, if we examine the temperature of these drops, in no case do they exceed blood-heat, although the atmosphere of the house may be much higher. It may originate, in part, by a continued course of humid treatment—an opinion I expressed in a former number of the Register; but it is

in vain to hope to prevent it by giving early ventilation, without other precautions. The reason why the most tender sorts are brought to such perfection in pots is this:—Suppose a plant to be introduced into a house in January, the whole is at once subjected to the same degree of heat; the root, in a few days, is furnished with innumerable new feeders, which at once afford an abundant supply to the plant; and this process continues so long as the pot is kept within doors; and, perhaps, it is not going too far to conjecture, that a vine so situated has more mouths taking in food than an old vine covering a large rafter, whose roots have to range in a cold wet border, unassisted by artificial heat. But from this no one must infer that grapes cannot be grown without artificial heat. Have we any well-authenticated records that the vine has been really benefited by the application of heat to the root, except in early forcing? Was not the grape as good thirty or forty years ago as now?

This calls from me a *rationale* of the process of forming the borders, after taking every precaution as to drainage. I have proved that upon the top of these drains (where most people place the compost to form the border) it is advisable to put from two feet six inches to three feet thick of fagots. The compost will be affected by this simple process for a number of years. In the first place, their elastic property has a most beneficial effect; and in the course of years, as they decay, they give way to the pressure of the border, which follows not in a mass, but in parts, and at different periods, leaving the whole open and dry—a state which the vine appears to enjoy. *When these and a few other precautions are taken, there is little to fear from shanking.* I quite agree with “A. L. A. T.” in his observations respecting the open quality of the compost, and have repeatedly applied rough materials when not previously in the compost; for whenever the root of a vine, or that of any other plant, comes in contact with impenetrable matter, it avoids this, and takes other and different directions—the reason why so many roots are found among these loose materials. Whenever the border of a vinery can be protected, in the months of February and March, from the spring snows or rains with some kind of covering, it is highly advisable, and may be accomplished by old paper lights or painted canvas; but I query whether there would not be much damage done in keeping them on longer than that period, as they might impede the production of roots.

At no period of the season is the constitution of a vine, or any other tree, put to such a trial as when the fruit is changed from an acid to a saccharine state; and probably at this time originates the whole cause of shanking; for if we observe a plant at this period, its whole system

is acted upon in such a manner as will not unfrequently cause instant death, and which no practical skill or attention can avert. We cannot witness this circumstance without great surprise; and the more the subject is attended to, the greater is the mystery. How can such changes take place? No sooner has a vine, loaded with fruit, passed this period, than it again commences its former mode of growing, and as the fruit requires less support the growth increases. It has been asserted that shanking proceeds from a weak state of the vine. I cannot disprove this, it being a common observation that every kind of vine grown in this kingdom has its peculiarities, and is acted upon in different ways, and at different periods, by this disease; and so is every species of tree that bears its fruit in clusters;—we observe it in the currant, in the raspberry, and in numbers of others; and I fear that the cultivators of the grape in warmer latitudes know too well the effects of its ravages.

Few gentlemen have paid so much attention to the vine as my present employer for the last forty years; but I do not hesitate to say that, at this time, he is as unprepared or undecided to give an opinion as he was at the above period; for, although he has repeatedly devoted a portion of his premises to experiments, and spared neither pains nor expense, the matter is yet unrevealed. I have, in conjunction with neighbours, made trials of a course of dry treatment, while, at the same time, they pursued a contrary one; and this course each has reversed, and all without arriving at any decisive conclusion. We have likewise reduced the crops of some vines to one-half or one-third per tree, without coming to the sought-for secret.

I have derived the utmost satisfaction from the experiments lately made by Mr. Paxton, in not thinning the bunches of the smaller sorts, and particularly the Frontignans, as Mr. Paxton always found that, whenever a bunch had been accidentally left unthinned, it was found to perfect its berries better than those bunches that were thinned. Mr. P. moreover states, that an unthinned crop of this year arrived at the greatest perfection.

Whether the berries derive benefit from their sides being in contact, or whether the thinning produces a check to their growth, I will not pretend to state; but whoever will leave a few bunches *unthinned*, will be able to judge for themselves how far thinning is judicious.

I remain, &c., yours, GEO. STAFFORD.

Willersley, Sept. 29th.

P. S.—It may be asked, Why do not grapes grown in the open air in this kingdom suffer from the malady of shanking, as those in houses

do? The answer is, They never arrive at that degree of perfection as those under glass, to render them liable to that instantaneous check of the system which affects it when the juices are changed from an acid to a saccharine quality.

A FEW WORDS OF ADVICE TO YOUNG GARDENERS.

THE art of gardening is conducted on what may be called a code of *principles*, rather than on a system of *rules*; for how exactly soever the experience of our forefathers and seniors may have been detailed in manuals and calendars, setting forth the various operations belonging to every season or month of the year, such is the uncertainty of our climate, and such the diversity of soils, situations, and seasons, that even the most general rules of practice can be but seldom exactly attended to. It should, therefore, be the aim of every young gardener to acquire, as soon as possible, an insight not only of the practice, but also of the principles, on which all the best practices are founded.

The business of a gardener being so much on the surface of the earth, it is necessary he should know something of geology; that is, he should have a good idea of how the different strata of earth composing the crust of our globe are placed with respect to each other; he should be acquainted with their properties, and be able at sight to call them by their proper names. Those that compose the surface strata are best known, as on their qualities and texture very much of the success of gardening depends. Clays, loams, sands, and gravels are the most common descriptions of surface soils, and their effects on the growth of plants are pretty well known; but, without doubt, much more depends on the nature of the substratum, in the successful culture of plants, than on the surface soil itself, however good. For this reason, the gardener will do well to get thoroughly acquainted with the substrata of his ground; it will assist him in trenching, in forming fruit-borders, and particularly in draining, when necessary.

Many of the earths are impregnated with metallic oxides, which are more or less deleterious to vegetation, and these the cultivator should be able to detect by some chemical test. To enable him to do this, it is requisite he should also know somewhat of chemistry—a science which, of all others, may be of the greatest use to gardeners; not so much for guiding or directing their practice, as for enabling them to account for many effects and phenomena occurring in their business, which must ever be to them inexplicable, without a knowledge of the powers of those immaterial bodies of which chemistry so largely treats. On this

science there are several cheap elementary books, one of which should always be in the garden lodge. It is a dry subject to a beginner, but the study of it becomes at last exceedingly interesting.

Geometry and mensuration are also necessary for the gardener ; for, though those portions of knowledge are not required in the usual routine of his business, they are often useful to him in forming designs, more especially if it be necessary for him to represent, in the first place, his alterations or improvements on paper. The art of mapping is indispensable ; and the ability to represent any disposition of the garden upon paper, facilitates very much the practice of tracing the same on the ground ; indeed, if he cannot do the one with the scale and compasses, he would find much difficulty in executing the other with accuracy.

Astronomy need not be a part of his studies, except as an amusement ; but meteorology he ought to make himself well acquainted with. Gardeners, like shepherds and sailors, should be " observers of the face of the sky ; " they are much in the open air, and they should habituate themselves to notice atmospheric changes, so as to acquire a foreknowledge of what is most likely to happen on the morrow. It is a great advantage to be able to foresee the approach of frost, or rain, or even of dry weather. The barometer is of little or no use as a weather-glass ; it only indicates the weight of the air at the present instant, but cannot show what the weight will be five hours hence. Thermometers are, however, particularly necessary, as well in the open air as under glass.

Next to the knowledge of all the more useful branches of gardening, a practical knowledge of botany is of the greatest consequence to the young man who intends to qualify himself for a respectable place. Botany is now-a-days so interwoven with gardening, that no practitioner of the latter is thought anything of, unless he also knows somewhat of the former. The care and culture of exotic plants is, in many cases, the principal part of the gardener's duty ; and he receives as much applause for the successful culture of curious plants, as he has for the production of the finest vegetables or the richest fruits.

The botanical names of plants is the first thing to be attended to, because this is the most useful part of the science. It has been said, indeed, that a man may be an excellent botanist, though he may not know the name of a single plant. This has reference to a man's scientific acquirements : but science alone will not do for the gardener ; he must be a practical botanist, by becoming conversant with the names, and nature, and native habitats of the collection, to lead him to the right method of treating them. Practical botany also includes the propa-

gation of exotics, and the way in which they may be best brought to show their flowers and fruit when desired.

When the young gardener has acquired as much practical botany as serves him for the time being—that is, in whatever situation he may chance to be placed—he may then apply himself to the study of systematic botany. He may first look over the sexual system of Linnæus, so as to obtain a general view of its outline, classes, and orders. A good plan for a beginner is to write out a scheme of the system on a large sheet of paper, to hang or be fixed up in his room. This may exhibit the classes, each followed by the orders, and under or opposite each order the name of one well-known plant, which, when compared with the characters of the class and order to which it belongs, will be a practical lesson not easily forgotten; and, by gaining thus a clear idea of any one class and order, a key to all the rest will be obtained.

When a good idea of the general scope of the Linnæan system has been mastered, that of Jussieu may be approached. Here all notion of the sexual system must be forgotten. The natural system recognises no distinctions founded on the numbers of the parts of a flower, but on their positions only. The grand divisions, however, must be first attended to; and, as these are founded on the physical differences of structure, they require minute investigation. From the grand divisions the student must descend to the subdivisions of each, thence to the classes and subclasses, and finally to the orders.

A tabular scheme of the Jussieuan system, also written out as advised above, will be of great use for fixing upon the mind the general complexion of this popular system; but it will require a much greater degree of attention and study to comprehend, before the student will be able to assign to any strange plant he may meet with its proper place in the system.

The investigation of the natural system will naturally lead the student to the consideration of the physiology of plants—a subject which he should lose no opportunity of becoming acquainted with; for, without a clear view of the physical constitution of vegetables, he will never be able to account for the union of a graft and a stock, how a wound on a tree is healed, or whence the new roots of a cutting are ejected.

The attainment of these different branches of knowledge requires that the beginner should first of all have a decent school education, which suffices for the ordinary business of gardening; but when engaged in practical botany, or in the study of its systems, he will find that a little Greek and Latin will be of the utmost use to him.

It is not necessary that he should be a Greek and Latin scholar; the acquirement of languages engrosses more time than can be afforded by a young gardener; but, as the proper pronunciation of botanical terms and names is absolutely necessary, he ought to provide himself with a Greek Grammar and Lexicon, and similar books in Latin. The meaning of Greek nouns and Latin adjectives is as much as he will require; and, if he can but understand the meanings of botanical names, though quite new to him, it will fix the names in his memory much more indelibly than if ignorant of their signification.

The above particulars may be considered superfluous and unattainable by a young man who is every day exposed to the weather, employed often in the most homely and laborious occupations, faring hard, and who has but little leisure for reading or study; but let not the youngster despair: it is wonderful what diligence and a settled resolution to surmount the difficulties of situation will accomplish for the beginner.

Were we at liberty, we could mention the names of several celebrated and distinguished men who,

" Though poverty's cold wind and crushing rain
Beat keen and heavy on their youthful days,"—(THOMSON),

have now retired from active life, enjoying the fruits of their early labours in comfort and in honour. Such characters are by no means rare in this country, and are impressive incentives to the most obscure probationer to persevere in his up-hill course.

Another way of gaining a knowledge of plants is by collecting specimens to form an herbarium. A general herbarium requires too much of a journeyman's time and space to be attempted; but one to correspond with the Linnæan system, and another of specimens of the Jussieuan orders, would be at once convenient and useful.

There is another expedient by which a knowledge of gardening may be expeditiously acquired; it is by keeping a journal of operations. Wherever a young man may be employed, whether in a *first* or *sixth-rate* place, he should always keep a written record of his own or others' employments in the various departments of the business. If well arranged in columns for the reception of dates, sowings, &c., with present and (room left for) future remarks, a very useful book for reference might be possessed, which would continue to be useful as long as the writer lives.

Journeyman gardeners can indulge in but few amusements; their laborious exertions incapacitate them for active exercises after the toils

of the day ; and their hours of rest, except what is necessary for sleep, should be devoted to mental improvement, rather than to cards, or other sedentary games of skill or chance. Music, for those who have a turn that way, is a pleasing and most rational amusement, and may be delightful to one's immediate associates ; but this talent must not make the possessor a wanderer from home.

But the principal and most important objects of the young gardener's attention must be the different branches of *culinary*, *fruit*, and *flower* gardening, to which may be added *arboriculture* and *landscape gardening*. These should engross the study of his youth, the attention of his manhood, and the cares of his declining years ; but the sooner in life he becomes master of all these, the better chance he will have of being advanced to a situation where he will have full scope for the exercise of his early acquirements of knowledge, and at the same time meet that reward which former assiduity and attention may merit.

There is still another paramount matter not yet alluded to, but which forms the chief excellence of a gardener's and every other man's character, whether old or young—we mean, propriety of conduct, moral worth, and faithfulness in the discharge of every social and professional duty. So necessary are these traits of character to a gardener, that his success in life depends even more on them than on the most shining professional attainments ; and often we have seen the defects of the gardener merged in respect for the man.

But, as there is no natural barrier which prevents the union of personal worth and professional ability, and as they are often seen in most happy conjunction, we conclude these remarks by strongly recommending to our young readers the absolute necessity of their endeavouring to afford, in their own cases, an exemplification of that happy union, which, while it reflects credit on the profession, renders honour and recompence to the deserving professor.

LANDSCAPE GARDENING.

LETTER SEVENTEEN.

SIR,—I ended my last communication with a few remarks on what are called picturesque forms. I have now to advert to the colours of objects which are more or less pleasing in landscape, and to the nature of surfaces, whether rough or smooth, and thereby pleasing or otherwise to the eye.

In viewing and speaking of the objects around us, their colour is always impressive; and if we approve or admire, we say they look gaily, or beautiful, or splendid; and if we dislike their colour, we condemn them as heavy, or dead, or cheerless.

Every object has a natural, and therefore a befitting, colour; and as the landscape gardener has often to design structures or buildings of different descriptions for enriching or improving his scenery, he must study to give them that colour that will best harmonise with the scenery around. Massive buildings should be always of a sober grey or stone colour; lighter structures, as alcoves, seats, fences, &c., may be painted of any tint that will be most suitable. Many are fond of making these objects as conspicuous as possible, by the aid of the house-painter's white brush, but this offends the landscape painter and every eye of taste; even a white chair or seat in a park or pleasure-ground is objectionable. According to the old distich:—

“ Pour le repos du corps je m'appelle une banc,
Pour le repos d'œil pourquoi suis-je blanc ? ”

So that, as the eye as well as the body requires repose, it should not be irritated by any glaring colour.

White objects are so conspicuous, that they quite destroy the harmony of a picture, and no painter will admit them if he can avoid it; they look much worse, however, in a painting than in real scenery, because in the latter they are only temporary. No objects of park-scenery are more admired than the hawthorn trees while in blossom, though no painter could be persuaded to introduce such glaring patches into a composition. In this instance, the ideas of the painter and landscape gardener are not in accordance; but this relates only to such plants which present, when in flower, broad masses of white: they agree respecting whitewashed buildings, which are always too conspicuous, whether in real or painted scenery.

Red brick or tiled buildings are not admired in landscape, being unsociable colours, and too far removed from the prevailing tints of surrounding objects. Mild colours and mellow hues are always the most pleasing in beautiful scenery, strong contrasts being only admissible in the picturesque.

The power of producing or changing colours cannot be exercised by the gardener but on a very limited scale: he may give greater apparent depth to a recess in a wood by planting the inner end with trees of dark foliage, or in disposing his flowers in a parterre, in order to produce the best effect; but, except buildings, fences, &c., there is little under his command.

It is in this particular that the power of the painter exceeds so much that of the gardener ; the former has every hue and every combination of hues on his palette, and can apply them so as to produce a finely-balanced picture ; he can qualify his strong light, and show forms in the deepest shade ; he can admit a sunbeam on a far distant object, and cover his foreground or middle distance with the shadow of a dense cloud. Such manœuvres belong to the practice of painting, and, when artfully executed, the most pleasing and valuable works are produced. The gardener's province is much more circumscribed ; he must take the general surface and natural features of the place as he finds them, add or take away where he can, and, after doing as much as is fairly practicable and judicious, it may happen that he is told by one of the *wise ones*, that his ability as an improver is only *negative*—that is, the best parts of the design are those on which he has done nothing ! The great Brown himself, or rather his memory, has suffered by a *lash* of this kind, as the finest feature (a hanging wood opposite the house) of his great work (Blenheim) is that which he left untouched. On his behalf it may be replied, that, seeing nothing could be done to improve it, he left it alone ; but this excuse does not seem to have occurred to his opponents.

Besides the form and colour of objects, whether natural or artificial, they have another property which makes them more or less attractive to the eye ; that is, the character of their surfaces, whether rough or smooth. Rugged or shaggy surfaces are less inviting to the eye (though their rigidity is only known by the touch) than those which are smooth. The native diamond is less lustrous and engaging than the brilliant ; the hostile black-thorn is more repulsive than the myrtle—the hedgehog than the kitten. All objects, therefore, that enter into landscape are more or less pleasing according as they are more or less smooth, or which have their surfaces composed of parts so uniform in size that the idea of smoothness is conveyed. Softness, which also can be judged of by an experienced eye, is nearly allied to smoothness in scenery, and without them there can be no absolute beauty. Their counterparts, as ruggedness, harshness, and hardness, are all of a picturesque character ; but the former are enhanced in value by a due intermixture of the latter. A beautiful face, adorned with ringlets of flowing hair, is more captivating than if the head were bald, and no ornament substituted ! so finely undulating ground receives additional beauty when partially clothed with trees and shrubs.

The finest scenes are, therefore, those in which smooth softness is varied by the irregular forms of arborescent vegetation, or where the same serves to partially conceal the rugged forms of rocks, or the deep chasms of a mountain stream.

These are a part of the particulars which the landscape gardener has to study in improving garden scenery. When he has discovered "the genius" of the place, whether the predominating character be beauty or picturesqueness, or of a mixed character, his dispositions will be easily introduced.

The style introduced by Brown has been so universally adopted in this country, that it has obtained the title of "English Gardening." Its principles have been carefully studied by several professors on the continent, and many places have been executed there which are even more elaborate in their details than anything which has yet been done in England.

The greatest defect in many of our English parks is their *vacant tameness*, arising from the want of undergrowths, stately timber trees and smooth turf being the only ingredients. This state of noblemen's and gentlemen's parks, in this country, has been brought about by the park-keepers rather than by the original designer. The finest-formed trees, to grow into money, and the sweetest turf for the deer and sheep, were the grand objects of the keeper; of course all undergrowths were extirpated, and all *picturesque* trees were doomed to the axe.

I remember, on one occasion, a nobleman consulting an eminent landscape gardener about the improvement of his park. His Grace had read "The Landscape," and, on the representations contained in that poetical effusion, had previously cut down every Scotch fir on his premises; but, notwithstanding this accession of light, the professor still complained of "the prodigality of shade," observing, that he "could not see the wood for trees," and advised a judicious thinning. His Grace immediately ordered his steward and woodman to go through the woods, and mark a fall; but afterwards, seeing so many marks of condemnation, thought it well to recal the professor to judge of the steward's taste. The professor was shocked to behold every straggler and every finely-branched "monarch of the wood"—in short, every tree which he himself would have preferred to stand—sentenced to come down. The steward's taste and judgment were reversed, and the professor was well paid for his interference; but he did not escape without a full share of odium for his want of knowledge of the beauty of trees and value of timber.

But how is this defect (the want of undergrowths) to be remedied? It is certainly more effectually done at first—that is, when the woods are planted—than afterwards: the planting and sowing may, however, be done at any time. No plants are suitable for this purpose except those which defend themselves against the browsing of cattle. Those which I saw raised for the purpose, and which answered so well at

Fairfax Hall, are the only sorts to be relied on, viz. holly, hawthorn, and juniper. The first and second of these should prevail near the house; the last, together with the others, at greater distances; and to which, if a portion of common broom and furze be added, though wild plants, they will not be considered intruders; for, though improper inmates of a pleasure-ground, they are quite natural, and even ornamental, on the outskirts of a park.

Such kinds may be either sown or planted; and, no doubt, the better way is to do both at the same time—that is, to drop a few seeds at the root of every plant. A single spit or spadeful turned to receive small plants from the seed-bed, or half-a-dozen prepared seeds*, will be all that is necessary to ensure a birth of undergrowth, wherever wanted, in the course of a few years.

These plants or seeds should be distributed in very irregular patches, under the old trees, and sometimes extended, here and there, beyond the margins of the groups or woods, to give the whole a more natural semblance, and to unite the lowest branches of the trees with the ground.

This addition to lofty woods would destroy their character as “*open groves*”—a feature in park scenery which has always been much admired, and, when on one or both sides, and near to the mansion, deservedly so; but when *every* group or wood in the park is an open grove, an air of vacancy and sameness is felt in viewing them—not being half so interesting as if a major part of them were judiciously varied and relieved by a base or fringe of underwood.

To look into the recesses of a wood is always interesting; but if the eye passes quite through, an unfavourable idea is created, as well of its extent as of its beauty.

Very many of our most celebrated parks are planted in this open-grove style, and on that very account are objected to, as already stated, by every one who has a taste for these things—they averring that, without the dignity, it is not a whit more interesting than the Dutch style of parallel or diverging avenues, which it superseded.

As country residences are of various characters, the embellishments around them should partake in some degree of that character; hence the landscape gardener's dispositions must vary with the circumstances of natural features, style and character of the building, extent of embellishment, and the proprietor's particular wishes.

Under the characters of residences, I may enumerate royal, ducal, and episcopal palaces; colleges and public halls; old ecclesiastical

* The seeds of holly and hawthorn require to be pitted for twelve months before they are sown.

establishments, and castles modernised in imitation of them; noblemen's and gentlemen's country seats, down to the suburban villa.

It is very obvious that these different establishments require different styles of exterior as well as of interior decoration. The royal palace should have accompaniments of a very different character, and on a much more ample scale, than any private residence whatever. The style of gardening introduced by Kent, as exemplified at Kew, was an attempt to bestow gracefulness and beauty on a place which he perhaps considered as too formal and unpicturesque (he, being a painter by profession, had become enamoured of irregular forms). On this spot he was undoubtedly right, because it was then, as now, a private, rather than a public, royal palace. What he did at Claremont was also in the irregular style; and, *unluckily*, his followers, the Brownists, not only embraced his principles, but considered them applicable to every residence in the kingdom, whether palace or abbey, castle or villa.

The Dutch style of ornamental gardening is certainly the best suited for the embellishment of a royal palace. Magnificence, grandeur, and dignity, should be the attributes of a residence of royalty, particularly if used for state occasions. The palace itself should occupy a commanding station, considerably elevated above the subject territory. To add dignity thereto, the gardener must subdue the ground by bringing it into an ostensibly artificial form, and the whole vegetable kingdom into subjection, by arranging his trees in right lines, to form avenues of approach to, or wide and open glades diverging in all directions from, the palace. The angles subtended by the avenues and glades should be thickly planted, to give massiveness to the sylvan features. No kind of intricacy of lines, or disposition of herbs or shrubs, are admissible here, which would detract from the solemn majesty of the scenes.

Hampton Court, Kensington Gardens, and parts of St. James's Park, were originally laid out in this style, and in all these places has been partly maintained. In the latter it has been lately departed from, and some very beautiful irregular scenery created; but with what propriety, as attached to a royal palace at one end, and to a military parade at the other, I shall not take upon me to decide.

A ducal palace has no peculiar character requiring any definite style of embellishment, other than what high rank and affluence demand; as a rule, however, nothing that is *petty*, either in design or execution, should be observable about such an abode.

An archiepiscopal palace, from the sacred character of the occupier, should afford all the advantages of solemn quiet and retirement; it should be embosomed in lofty groves of trees, chiefly evergreens, cedars,

cypress, yew, &c., to shed a suitable gloom over the quiet walks, the cloisters, the study, and the chapel of the palace. Gay gardens, open lawns, and sprightly scenes would be here misplaced, for *seclusion* should be the predominating characteristic of the demesne.

Castellated mansions should be accompanied with traces of their ancient defences, in respect of the disposition of the ground round the base. In the formation of a scarp, counterscarp, glacis, &c., the designer may make a very convenient and very suitable disposition of the ground and plantation, by taking a lesson from the art of fortification.

(*To be continued.*)

MISCELLANEOUS INTELLIGENCE.

VEGETABLE MORPHOLOGY.—At a meeting of the Horticultural Society, held at the house in Regent Street, on Tuesday, the 20th of September, a branch of a pear-tree was exhibited as a great natural curiosity. The branch had one pear upon it, and the axis of the shoot, on which the fruit was produced, was continued through the pear, and developed several leaves above it. Perhaps it would be more proper to state, that the axis of the shoot did not terminate in the usual way; that is, at the base of the footstalk or peduncle of the fruit, but was prolonged through the fleshy calyx, and was continued beyond.

This accident is by no means uncommon, for many of the highly cultivated varieties of the pear and other fruits present the same kind of malformation frequently. Mr. Saul, of Lancaster, a most ingenious mechanist, and an enthusiastic lover of gardening, sent us a drawing of a shoot having no less than three imperfect pears upon it, one above another. Pine-apple plants sometimes present the same deformity—that is, bearing three fruit on the same stem, one above another. The double-flowering cherry will occasionally protrude a shoot through the middle of a flower, leaving the circle of petals behind. All double flowers are similar productions, of which the prolific *Hen-and-Chicken Daisy* is a remarkable exemplification.

As we have double or monstrous flowers, so we have double fruit; such as a large and a smaller pear growing on the same footstalk, double cherries, double plums, &c.; double leaves, double stems, and many other irregularities in the growth of highly cultivated plants.

Other deformities are visible on the trunks of trees, like vast warts or wens, which keep increasing with the annual growth till they become

of very great size. Such may be frequently seen on aged beech and elm trees, and which, when cut up for use, are highly prized by cabinet-makers for cutting into veneers.

Vegetable membrane is sometimes curiously distorted by insects. The mossy tufts on the sweetbrier and dog-rose; the various sorts of galls seen on the buds, leaves, and petioles of oak-trees, showing the most elegant subdivision, and regular expansion of the cuticle, and transformation of the various members; are all the works of insects, and are similar to the tubercles, called "*fingers and toes*," on the stems and tubers of the genus *Brassica*. Other insects, as the *Eriosma*, corrode and blister the bark, causing unnatural prominences and enlargements, every way unlike the natural expansion of the parts.

Whether we examine the regular forms and beauty of the oak-galls, or the irregular moss-like tufts on the brier, we cannot but be surprised at the versatile nature of vegetable membrane, that can be turned into forms so decidedly different from any other part of those plants, and by an obstruction so minute as the egg of a very small fly, deposited in one of the sap-vessels of the bud or leaf: and, if a result so remarkable be caused by the interposition of so small an agent, how much more must the manipulations of the cultivator affect the ordinary evolutions of plants, and cause them to fly from their normal habits?

It is observable that such departures from the normal or natural form (as a shoot growing through a terminal flower or fruit), only occur among the highly-pampered *varieties* of flowers or fruit, such incidents being rarely met with among plants in a state of nature. Hence it has been long considered by old gardeners, as well as the older botanists, that such phenomena and irregularities were solely attributable to high cultivation, causing derangement in the structural habit in consequence of the various expedients of culture to which they were subjected.

These variations in the growth of domesticated plants are very similar to what takes place among domesticated animals. For proof, we have only to consider what diversity of size, and shape, and colour obtain among our herds and flocks, in our stables, kennels, and poultry-yards; all which variety is evidently the result of domestication.

From these instances of metamorphosis, to which both animals and vegetables are subject, under the expedients of culture or attack of insects, we may reasonably conclude that the membranes of the latter, and the constitutional structure of the former, are both susceptible of derangement, in so far as their external integuments or members are liable to foreign or artificial influences.

But the metamorphosis of plants is explained and accounted for in a very different manner by several of our first-rate modern botanists; they

deny that irregularity of the growth, as exemplified in the specimen exhibited at the meeting alluded to, is a consequence of high cultivation, or of any derangement effected by art ; on the contrary, they consider such aberration of the growth as a true indication of the real character of vegetable membrane. "A plant," say they, "is compounded of root, stem, and leaves, and many plants live for years without exhibiting any other member or organ whatever ; but, in the case of a pear-tree, if it receive any check, whether by art or accident, so that the shoots cease to lengthen, the leaves, which would have otherwise been developed at considerable distances from each other, become crowded together on the point of the shoot, and there become metamorphosed ; the outer ones changing into involucrums, or bractea, or calyces and corollas, and the inner ones transformed into stamens and pistils : and thus a beautiful flower is exhibited, followed by a pulpy fruit containing the seeds. But should the lengthening tendency of the shoot be not wholly arrested by this metamorphosis, it is continued onwards, and appears above the place, as was shown at the meeting of the Horticultural Society."

The gravamen of the above representation is briefly this :—Roots, stems, and leaves are the primary and rudimental organs, or organised *material*, of the plant, out of which all other members, whether simply foliaceous, florescent, or fructiferous, are *fortuitously* formed, expanded, and matured ; hence a fair inference is deducible, namely, that spines, prickles, stipulas, bractea, calyces, corollas, stamens, disks, pistils, and seeds, have no rudimental identity in the system, but are merely the results of accidental circumstances.

The abettors of this physiological doctrine do not endeavour to prove it by showing that leaves are transmutable into the various members of a flower, which would be the direct and logical line of argument ; but, conversely, by showing that these members are occasionally changed into leaves, concluding therefrom that their normal or original condition must have been that of simple leaves.

That a party-coloured foliar expansion is sometimes seen on the stem or scape of a tulip, which is neither a proper leaf nor a petal, is well known : that there are many proliferous, and thousands of monstrous flowers and fruit, is indisputable. All these instances of exuberant growth are called *irregular metamorphoses*, and the ordinary development of plants is called *regular metamorphosis* ; in other words, when certain circumstances occur, the leaves are suddenly changed into flowers and fruit.

This branch of the science of botany having been adopted by a great majority of the leading botanists of the day, gives the doctrine itself a

sanction which operates to dispel the doubts of those who are less versed in the science. Yet we cannot help observing, that those who have taken the most pains to explain it, proceed no further in their illustration than showing that the capsule is a convolved leaf, adding nothing about the identity and numbers of the seeds, which, if all the floral members are only contorted leaves, the seeds must also be leaves. Nor is it explained how it happens that plants which have *no leaves* bear, notwithstanding, large and magnificent flowers, such as *Cereus*, *Stapelia*, and the like.

It has long been believed that plants, like animals, are composed of definite organs, each fitted to perform distinct functions for the well-being of the system; and more especially was it believed, that the reproductive organs had identity as well as leaves, or stems, or roots. The new doctrine of morphology teaches the reverse, roots, stems, and leaves being permanent and rudimental—flowers and fruit only casual and uncertain.

BOTANICAL EXTRACTS.—“*Pæonia*.—The Pæonies derive their name from Pæon, by whom they were, first medicinally employed: it was with them, according to Homer, that he cured Pluto of a wound inflicted by Hercules. By the ancient Greek physicians, the Pæony was held in very high esteem; but their praises are too extravagant for sober repetition. Among other superstitions, they believed it to be of divine origin—an emanation from the moon, and that it shone during the night; also, that it had the power of driving away evil spirits, averting tempests, and protecting harvests from injury—superstitions which probably sprang from each other, and gave rise to the long train of errors above adverted to. Modern times are not, however, free from some remnants of these absurdities. The anodyne necklaces, still sold to prevent convulsions in children, and to ease dentition, are made of beads turned from the root of the common Pæony. Its antispasmodic powers, though often dwelt on, are very feeble, and it is chiefly to be regarded as a nauseous and acrid bitter. The seeds of *P. officinalis* are said to be emetic and cathartic; and the roots of *P. anomala* and *P. albiflora* are, according to Pallas, eaten in Siberia, either simply boiled, or as an ingredient in soups. ‘The seeds of the latter are also,’ he says, ‘used in the same country instead of tea.’

“The Pæonies, however, are chiefly cultivated for the beauty of their flowers; and, in China, the Moutan is as great a favourite as the rose is here. The Chinese poets have celebrated it in verse, and their gardeners claim the honour of having rendered it suffrutescent by skill and care. The several varieties of Moutan are much less tender

than they are usually considered, and will flourish in our gardens with very slight protection.

"*Nelumbium speciosum*.—The *Pythagorean bean* is supposed to have been the fruit of this plant—the *water Lotus*, formerly a native of Egypt, and other warm regions in Africa and Asia, but not to be found in the Nile, its most celebrated habitat of antiquity. It was called *Cyamus* by the ancients, and its present generic name is an alteration of the Cingalese word *Nelumbo*.

"The *rhizoma*, commonly called the *creeping root*, as well as the seeds, are eatable, and they are said to be both savoury and wholesome. In China, the plant is called *Lein-faa*, and the seeds and slices of the jointed rhizomas, with the kernels of apricots and walnuts, alternated with layers of ice, were frequently presented to the British ambassador and his suite at breakfasts given by some of the principal mandarins. The tubers are preserved by the Chinese in salt and vinegar for winter use. In Persia, Japan, and other countries, it is much esteemed as food, and its seeds manufactured to serve as bread. In China and Japan it is regarded as a sacred plant, considered to be a pleasing offering to their deities, and their idols are often figured sitting on its leaves. *N. luteum*, which is a native of America, has been naturalised in the ponds as far north as Philadelphia, and its fruit is much relished by the Indians and by children.

"*Nymphia*, *Nuphar*, and *Euryale* are allied genera; some of the former are highly ornamental aquatics, and the flowers of some are fragrant, others are scentless, and those of *Nuphar lutea* have an alcoholic odour resembling brandy. They are also physiologically interesting from the varied elongations of their peduncles, to suit the varied depths of the waters in which they grow, and their almost sensitive irritability, which causes their daily elevation above the surface of the water, and the expansion of their petals during the sunshine, and the nocturnal collapse of the flowers, with their drooping heads, which, in some instances, lie down on the shield-like leaves, and in others retire below the surface of the water during the night, but again emerge on the coming of day.

"*Ficus Carica*.—The common fig, and *F. elastica*, or Indian-rubber tree, are the most important species of the genus; the former is a dietetic plant; the latter for the caoutchouc, with which it abounds. Several other species, both of this and kindred genera, yield this valuable and curious substance, which is daily becoming of more and more economical importance. Even now, (1835,) although for such a short time known, and for a still shorter time rendered generally subservient to the arts, a volume might be written on the purposes to which it is applicable, or has been already applied.

"The common fig, originally a native of the East, and abounding in *Caria*, (whence the specific name, *Carica*,) has been naturalised for immemorial ages in various parts of Africa and Asia, whence it spread into Greece, and thence into Spain, Italy, and other parts of Europe. The great estimation in which figs were held in former times, may be presumed from the frequent mention that is made of them in the earliest traditions and most ancient records we possess. The leaves of the fig-tree formed the aprons with which our first parents clad themselves in Paradise. Figs are mentioned among the choice fruits of Canaan—the promised land 'flowing with milk and honey;' and, in after ages, the want of blossom of the fig-tree was considered as one of the most grievous calamities by the Jews. Cakes of figs were included in the presents of provisions by which the wife of Nabal appeased the wrath of David. In Greece, when Lycurgus decreed that the Spartan men should dine in a common hall, flour, wine, cheese, and figs were the principal contributions of each individual to the general stock. The Athenians considered figs an article of such necessity, that their exportation from Attica was prohibited; and when Xerxes invaded Greece, one of the advantages which he proposed as the result of his expedition was, that he should have unlimited supplies of Attic figs. Either the temptation to evade the law which prohibited the exportation of figs from Attica must have been very great, or it must have been much disliked; for the name which distinguished those who informed against the violators of the law, *sycophantas*, became a term of reproach, from which we obtain our word sycophant. At Rome, the fig was carried next to the vine in the processions in honour of Bacchus, as the patron of plenty and joy; and Bacchus was supposed to have derived his corpulency and vigour, not from the vine, but from the fig.

"The Romans, knowing the great nutritious power of this fruit, lessened the rations of their slaves during the fig season. The wrestlers fed also on figs to strengthen themselves, and pigs and geese were fattened on them; the latter especially were fed on figs, when it was desired to enlarge the liver as a delicacy. All these circumstances indicate that the fig contributed very largely to the support of man; and we may reasonably account for this from the facility with which it is cultivated in climates of moderate temperature: like the Cereals, it appears to flourish in a very considerable range of latitude; and even our own country frequently produces fine fruit, without much difficulty, in the open air, especially in the southern counties; yet, from prejudice—probably from the fig having been once a common vehicle for poison—it is not so much cultivated here as it might be, although

it is still confessed that it belongs to more genial climates to realise the ancient description of peace and security, which assigns these best blessings of heaven to 'every man under his own fig-tree.'

"Figs form an important article of Levantine commerce, and between 800 and 1000 tons are annually imported into Great Britain alone, principally from Turkey. Smyrna is a great fig mart, and Madden, in his 'Travels,' gives the following account of the interest they there excite:—'In Smyrna, the subject of figs is the fruitful theme of conversation. You ask about the gardens of Bournabul, and you hear that figs abound there; you inquire about the curiosities of that place, and they lead you to the fig-mart. Solicit information on politics, and you are told 'figs are low;' and when you seek further intelligence, you are told 'figs are flat.' In short, go where you will, the eternal cry is figs, figs, figs! and the very name, I apprehend, will be found engraven on their hearts at their decease.'

"Figs are demulcent and slightly laxative; they have been long used in domestic medicine as favourite poultices. This probably arose from King Hezekiah's boil having been cured by a lump of figs, applied according to the directions of Isaiah. This was two hundred and sixty years before the time of Hippocrates, and is the most ancient cataplasm of which history makes mention. In the Canaries, in Portugal, and in the Greek Archipelago, a kind of brandy is made from figs.

"*Corypha umbraculifera*.—The majestic Talipot palm of Ceylon is described to be as big and tall as a large ship's mainmast, and very straight. The leaves, which are very large—some capacious enough to cover from twenty to forty men—are of great use, for, being dried, they are very strong and limber; though very broad when open, they will fold close like fans, and are then no bigger than a man's arm. The whole leaf spread is round, but it is cut into triangular pieces for use; these the natives lay upon their heads when they travel, with the narrow end foremost, to make their way through thickets. The soldiers there all carry these umbrellas, not only to shade them from the sun, and keep them dry in case of rain on their march, but, when set on end, to make tents for them to lie under. A magnificent crown of leaves, as is usual with palms, terminates the stately column, one hundred feet in height, which is formed by the trunk. The Talipot bears no fruit until the last year of its life, and then yellow blossoms, most lovely to behold, but very strong-scented, come out on the top, and spread abroad in great branches; the fruit is in such abundance, that one palm will yield seed enough to stock the whole country; the berries are round and hard, the size of our largest cherries, but not good to eat. The flowers smell so strongly, that the Ceylonese cut the palms down, when

growing near their houses, before the blossoms open. The trunks, when young, are full of a mealy pith-like substance, which is beaten in mortars, and cakes made of it, that have very much the taste of common white bread. The leaves are used, instead of thatch, for roofing houses, and also for writing on with an iron style. Most of the books shown in Europe for the Egyptian papyrus are made from the leaves of this palm. In Malabar it is called *Codda Panna*, and is certainly one of the most stupendous of the palms."—*Bur. Bot.*

This plant is no less singular in magnitude than in its mode of inflorescence. It is an *individual* plant, of which there are but few instances in the vegetable kingdom, except among annuals, and there exist but few of them. The Talipot is incapable of division, having neither suckers, branches, nor buds, and is increasable only by seed. The Cockscomb *Amaranthus* (*Celosia cristata*) is a familiar instance of a similar constitution; it has only one stem, and one terminal crest of flowers, which, when the seeds are ripe, the whole dies. In these two instances of individual plants, it is observable that, though nature has denied them the power of reproducing themselves by offsets or branches, to remain after the central flower is gone, yet they are both most productive of seminal progeny to perpetuate the species. Many compound plants have terminal flowers on each of their divisions, such as the common American Agave, and the common House-leek. When the flowers fade, and the seed is ripe, the whole division of the plant dies: this is also the case with many of the perennial grasses, as well as among annuals.

EXTRACTS FROM A CATECHISM OF COTTAGE GARDENING, a second edition of which has just been published. Ridgways, 169, Piccadilly.

This little tract is intended for village schools and cottagers, and contains plain and brief directions for cultivating every kind of vegetable in common use. It is dedicated to the patrons and patronesses of village schools in Great Britain and Ireland, and is preceded by a few introductory remarks, from which we have made the following extracts:—

"At no former period has the education of the lower classes of society been more an object of public concern than at the present. National and other schools have been established in every parish, if not in every village, in the kingdom. It has always been considered particularly desirable that, in such establishments, some useful occupation should be taught along with the ordinary education of the labouring poor. Needle-work, knitting, &c., is the easily-taught business of

female children ; but useful employment is not so conveniently found for school-boys. To all those who are intended for rural occupations, a knowledge of the first principles and practice of agriculture and gardening would be a valuable acquisition. The first, however, could only be taught theoretically, because the practice requires a field for operations by far more ample, and means more expensive, than could be attached to a village school. But the second could be easily communicated ; a comparatively small spot of land would suffice to show the practice and its results, while the rules of the art might be acquired in the daily school exercises, whether as reading, spelling, or catechetical lessons.

“ Next to the inculcation of religious and moral principles, those of gardening are peculiarly necessary to every grade of rural society. Every individual, from the highest to the lowest, has, or wishes to have, a garden ; the management is as easy as it is rational—as pleasing as it is profitable. Even children delight in gardening ; and at school, if occasionally introduced as a task, it might be an incentive to the acquirement of more intellectual knowledge, making the latter less fatiguing to the giddy mind of childhood.

“ Entertaining the above ideas, and seeing the example of many academies on the continent, the author has employed himself in drawing up the following little work. He has chosen the catechetical form, in order that it may bear some resemblance to other elementary school-books ; so that the teacher may give a portion of the questions to be answered by the pupils, as he does those of religion, history, &c. By such exercises, many, if not all the most useful and common practices may be impressed, and, when connected with a view of the operations, fixed on the mind.

“ The book will be useful to the master as well as to his scholars, as enabling him to direct the operations and culture of what should redound to his own advantage, as tenant of the school-garden ; and no task imposed by him in the business or care thereof would ever be deemed a hardship by the pupils.

“ As a remembrancer and book of reference, it will be useful to every cottager who is not already sufficiently acquainted with cottage gardening ; the directions are briefly plain, and can hardly be misunderstood.

“ *Vegetable Poisons.*—It is very necessary that children should know the names and appearance of hurtful or dangerous plants (some of which grow wild in every lane and common), in order to avoid them. For this purpose, every school-garden should have a small bed marked **POISONS**, and containing a plant of each, that the children may become

familiar with their forms, while they receive advice to be aware of their bad effects. The following are the most common, viz. :—

“ *Bryony* grows in hedges ; it has long climbing stems, greenish-white flowers, succeeded by little bunches of red berries, hanging conspicuously after the leaves have fallen. The root is a large tuber, containing dangerous qualities.

“ *White and black*, and all other species of *Hellebore*, are garden plants, and accounted poisonous.

“ *Cuckoo Pint*, or ‘*Lords and Ladies*,’ grow under every hedge ; their spikes of red berries are apt to attract the notice of children.

“ *Meadow Anemone* grows in damp and shady places ; the flowers are pretty, and often in the hands of children.

“ *Spurge*. Two or three sorts grow wild ; they are known by their milk-like juice.

“ *Butter-cups*, so plentiful in meadows and pastures, have an extremely acrid quality, which renders them dangerous.

“ *Meadow Narcissus* is common in some places : the bulbs should not be played with by children.

“ *Henbane* grows in lanes and waste ground ; it has a nauseous scent, and thereby easily detected.

“ *Aconitum* is cultivated in gardens for its flowers, commonly called monkshood : is very dangerous.

“ *Foxglove* grows on every hedge-bank, having tall spikes of purple flowers : it contains noxious qualities.

“ *Dwale*, or *Deadly Nightshade*, grows in shady waste ground : the berries are like small purple cherries, and too inviting to children. This plant should be eradicated from about every village.

“ *Bitter-Sweet* grows in hedges—has flowers exactly like those of the potato, only much smaller : these are succeeded by bunches of red berries—dangerous.

“ *Fool’s Parsley* grows on the sides of ditches, and in meadows ; it resembles common parsley, but the scent is very different.

“ *Hemlock* is found in hedges, or in waste corners behind farm-houses ; its purple-spotted stem, much-divided leaves, and nauseous scent, easily point it out.

“ Besides the foregoing, there are the *Thorn-Apple*, or *Stramonium* ; the *Colchicum*, or *Meadow Saffron* ; and all kinds of *Toadstools* should be proscribed, except for medical purposes administered by medical men. Children should also know that the berries of the *Wood-Laurel* are dangerous, and that the *Yew-tree* is poisonous to cattle not used to it, more especially if they eat the clippings of yew-hedges thrown out of a garden.

“General Advice on the Subject.—Notwithstanding the business of gardening is governed by a set of axioms adduced from experience, which regulate the operations as to the times and manner of performance—and though by attending to them the cottager cannot do much amiss—yet it should be understood that a good gardener is never bound exactly by rules; discretion must often be exercised: there are many particulars which, if known and attended to, augment considerably the annual produce of any given spot of ground. This is accomplished by studying well the nature of the crops, how they succeed each other, and by taking care that no ground be suffered to remain unnecessarily vacant in the growing season. Soon as one crop is nearly fit for use, another should be in readiness to take its place. All vegetables that may be used at any stage of their growth, as cabbage, lettuce, onions, &c., may be sown or planted in drills, on ground intended for other crops; for, soon as the first begins encroach injuriously on the second, it may be drawn for use. For instance, the ground intended for peas or beans in the spring, may be digged in the autumn, and immediately planted with coleworts, in double rows, at such distances as will admit beans to be dibbed, or peas drilled between in January and February. So also, before bean or pea haulm is cleared away in summer, the spaces between the rows may be digged and planted with cabbage, broccoli, or any other winter crop. By such management, together with the facilities afforded by the row-culture of putting in immediate crops, much more may be made of a limited piece of ground, than can possibly be raised where broad-casting seed prevails. It is true that onion, radish, and lettuce, are broad-casted together: and if attention be paid to draw away the radish and lettuce in time, the onions suffer no injury. This, though allowable in cottage gardening, is suitable but for few kinds of vegetables, and is not to be generally recommended, except when confined for want of room.

“Although the cottager may amuse himself by cultivating a variety of esculent vegetables, he must not neglect the more useful kinds, for they require unceasing attention. He may, to be sure, grow cucumbers and pumpkins—he may have a row or two of Grainge’s Cape broccoli, which he may use himself, or exchange with his master for something better—he may even have a small border for flowers—but the potato, cabbage, savoy, onion, carrot, parsnep, broad beans, and scarlet runner, demand his chief care. Peas require more space than the produce is worth; one row only, and that of Knight’s Marrowfat, may be sown; but even this fine productive pea is inferior to the runner for family use. Next to stocking his garden with the most useful kinds of vegetables, the cottager must use his best endeavours

to keep it in good heart. Success depends chiefly on this, and, therefore, he must collect every particle of vegetable or animal matter in a hollow place between his house and garden, to receive every kind of drainage from the former, and all refuse from the latter; also all sorts of litter and cattle droppings from the public roads, lanes, and commons, which, when thrown together and turned once or twice till sufficiently rotten, will be found excellent manure. Ashes, lime-rubbish, marl, or chalk, may also be added, and mixed in the compost.

"Saving Seeds.—The only seeds that are worth the cottager's while to save, are those of onion, scarlet runner, radish, and coss-lettuce; as to cabbage, savoy, carrot, parsnep, &c., there is such risk in saving them true, and cost so little if bought, that the amount can be no object to the buyer. When attempted, however, the finest and truest specimens of the crop should be chosen to produce seed. A few plants of radish and lettuce may stand where they were sown; a score of the first pods may be left on the runners; and half-a-dozen of the best onions planted in a row, on an open spot of the garden, in the month of February, will yield seed enough for the following season: indeed, saving onion-seed should be a particular object of the cottager, as, by having ten or twelve ounces to sell, it will enable him not only to buy all his other seeds, but a load or two of dung besides."

The author has added the necessary quantities of seeds for a cottage garden—the suitable flowers, and implements, and directions, in the body of the work, for the culture of tubers, stems, leaves, and leaf-stalks, esculent flowers, and esculent pods, seeds, &c., with a monthly calendar.

VEGETABLE ORGANISATION.—“In the most simple and elementary forms under which plants present themselves to our notice, the cellular texture alone is found to occur. These plants, the *Cellulares* of Decandolle, constitute one of the primary divisions of the vegetable kingdom. They differ greatly, both in their internal configuration—in the several organs or parts of which the vegetable frame consists—in the roots, stems, branches, leaves, and parts of fructification—not only from plants of a higher order, but also among themselves. There is little apparent analogy between the rose that delights us with its fragrance, and the noisome fungus, Nature's scavenger—between the sturdy oak and the crust which attaches itself to the surface of the solid rock, either as a whole or in any of their parts; and yet the transition from one of these extremes to the other, through the varied tribes of this part of Nature's wide domain, is so gradual, and the relation by

which many of these tribes are connected together so intimate, that the difficulty botanists experience in the arrangement of the objects of their studies frequently consists more in the separation of allied plants and families, than in their union with each other into groups.

“ The structure of the powdery lichen, and of its allied species, is most simple, consisting of vesicles only, and those scarcely connected together. Other forms of the vast tribe of lichens—those humble individuals of the vegetable race which form the first of Nature’s coverings—which act, as it were, the part of pioneers, and, though of small repute, and to the unobservant eye insignificant—are the very instruments which it has pleased the Almighty Creator and Ruler of all to employ as the secondary agents of his power in breaking down the surface of the hard and barren rock, and rendering many a wild and uncultivated region fit for the nourishment of larger tribes of plants, and ultimately adapted to the higher orders of animals—yes, even of man himself. Other forms of the vast—and shall we not say important?—family of plants are found, in which these primary vesicles are closely compacted into crusts of films, crusts of extreme tenuity, but covering the surface of stones, and rocks, and the bark of trees. Such are the curious *Lecidea geographica*, so called from its resemblance to a chart or map; the *Graphis elegans*, and *Opegrapha scripta*—a species of mimic writing, &c. The transitions from these filmy expansions to the foliaceous lichens—such as the common yellow wall-lichen, *Parmelia parietina*, and its allies—by the splitting up, as it were, of the crust, in different directions from the surface to which it is attached, into scales or lamina of various thickness—as in *Squamaria* and others of the scaly lichens—is well known; and again from these through the *Cetraria Islandica*, or Iceland moss, and others in which these scaly and leafy crusts are gradually lengthened into thongs, to the fibrous or filamentous lichens on the one hand, and into some of the tribe of *Algæ*, or sea-weeds, on the other.

“ The same gradual development of the cellular structure may be traced in the *Algæ*—a family of plants, the greater number of which are inhabitants of the ocean. This is observable in their fructification, from the simple vesicles of *Porphyra* and *Ulva*, to the variously compounded granules of *Gracilaria*, *Rhodomela*, and *Microcladia*—changes accompanied by corresponding variations in the structure and configuration of the entire plants.

“ The transition from the *Algæ* to the mosses, in which the external form approaches still more to those vegetable tribes where the cells, becoming gradually more elongated, approach more or less to the tubular structure, is well marked by some of the *Hepatica*, or liver-

worts. Of these last, the frond or leafy expansion of the *Riccia natans* affords a beautiful example of the cellular structure, and its general appearance comes very near to some of the *Algæ*; while, on the other hand, many of *Jungermannia* (another genus of the liverworts) are almost as closely allied to the mosses.

“ The mosses are universal favourites; and it is impossible, even for the most superficial observer, to have glanced over any of those beautiful plants without admiring the general elegance of their forms, and the extreme delicacy of their leaves and other parts. The most finished drawing can convey but a faint and imperfect idea of their extreme beauty. We must here have recourse to the microscope for ourselves, and, when thus examined, so as to display their internal structure—the modifications of cellular texture, as seen in their transparent leaves—the varied forms and delicacy of these parts—the curious structure of the filmy teeth which encircle the mouth of their capsules—the interest which attaches to these productions is increased ten-fold, and the reflecting mind is lost in the contemplation of the infinitely varied beauties of form and structure which proceed from the Master-hand, and which prevail in every department of nature. In the works of the Creator, there is nothing imperfect—nothing unfinished, whether in simplicity of design, or in the most delicate or refined construction. As far as our limited powers will enable us to comprehend it, the same sublime unity of purpose is displayed throughout. We look above us, and contemplate the vastness of the heavenly expanse—its brilliant orbs preserving their prescribed limits, and rolling through in perpetual harmony, and with never-varying regularity—and we feel lost in the vastness of the power and wisdom of that Divine Intelligence which has called them into being, and which presides over, directs, and regulates the whole. We are ready to exclaim with the psalmist, ‘ What is man, that Thou art mindful of him? and the son of man, that Thou visitest him?’ But shall we therefore infer, with the disciples of a false philosophy, that He regards not the beings whom he has called into existence?—that He, having breathed into them the breath of life, there leaves them, and casts them aside as utterly beneath his attention and care? Let us turn to the humble moss which groweth upon the wall, and to the insect flutterer which revelleth its short hour in the setting beams of a summer sun. We behold the same attention bestowed upon these minute existences—the same care in the adaptation of the circumstances under which they are placed to the purposes which they are destined to fulfil. Can we, then, doubt that even ‘ the hairs of our head are all numbered,’ and that He who so clothed the grass of the field will fulfil all his purposes of love towards that being, who,

though fallen indeed, and in himself powerless of good, is yet gifted with faculties by which he can investigate, and in a measure comprehend, the mighty work even of the high and lofty One, who sitteth upon the circle of the heavens, and inhabiteth eternity.

“The various species of the fern tribe—those leafy expansions, some of which rival even the mosses in elegance of form and delicacy of structure, while others vie with the loftiest denizens of the tropical forests—are among those forms of vegetation, in the internal texture of which tubes or vessels, as well as cells, are found to exist. They constitute, as it were, the transition-link between the cellular and vascular plants, being allied to the latter in internal structure, while, in external configuration, and more especially in their fructification, they are intimately connected with the former. In that covering of herbage, the verdure and freshness of which gives such a charm to the rich scenery of the valleys and plains of our native country, we find many different kinds of plants. These are called *Gramineæ*, or grasses, and resemble each other very closely in their general structure and appearance, constituting one of the most natural groups with which we are acquainted. They have, for the most part, fibrous roots, a tubular jointed stem, narrow ribbed leaves, and an elongated spike or panicle of flowers; in all which parts, whether root, stem, leaves, or flowers, we find the cellular structure to be combined with the vascular—vessels or tubes traversing in a longitudinal direction the general cellular texture of the plant. The same combination of vascular and cellular structure is found in the sedges and rushes, in the numerous species of *Iris*, in the lilies, the *Orchideæ*, and others, constituting the first division of the flowering plants. To trace the connexions between the several families of the *Vasculares*, or to examine the gradations by which they insensibly pass into each other, is not necessary for our present purpose, since, in these more complex and highly organised forms of vegetation, there is a unity of structure prevailing, with certain modifications, throughout the whole. It will be sufficient if we examine the several parts or organs of which these plants consist, separately and in detail, pointing out, as we proceed, the modifications in the development of these several parts as they occur in plants of a higher or lower degree of organisation.

“The more important divisions of the vegetable organisation, as it exists in the more highly developed families of plants, are, the root, the stem and branches, the leaves, the flowers, the fruit, including the seed, and, lastly, bulbs and buds.

“The external characters of the root vary considerably. In grasses, as we have just observed, it is generally fibrous, sometimes creeping,

rarely bulbous; whereas, in many others of the monocotyledonous plants—the tulip, for instance—it is bulbous. In every true root, however, a fibrous portion will be found to exist; and it is the ultimate fibrils or divisions of the fibrous part of the root, with the minute vascular bodies at their extremities, which constitute the essential part of this organ. It is by these little vascular terminations of the fibrils of the roots that plants obtain their nourishment from the soil in which they grow. They are found equally in the lofty forest-tree and the herb which grows beneath its shade, and are equally necessary to the existence of both; for, if by accident or design the fibrils are materially injured, the plant withers and dies. In their internal structure, roots, with some exceptions, will be found to resemble the stem; in fact, in many instances they consist of a main descending trunk, branches, and twigs, the organisation of which is precisely conformable to the ascending stem and its divisions, as it is found above ground.

“The stem, or trunk, varies much in different families of plants. In those among the acotyledonous plants in which it occurs, it consists of a thin epidermis or cuticle, surrounding a pulpy matter, the texture of both which parts is almost entirely cellular. A few fibres or vessels are, however, found in the stem of the fern tribe, forming an exception to the general internal organisation of this division of the vegetable kingdom. In the monocotyledonous plants, the stem consists also of a cuticular envelope and internal cellular substance; but the cuticular portion is more dense and firm, and the cellular texture of the internal part of the stem is traversed by longitudinal fibres or vessels, several of which are arranged together in bundles. In the dicotyledons, the stem is composed of bark, wood, and pith. The bark, which corresponds to the cuticular part of the stems of the acotyledonous and monocotyledonous plants, is formed of several layers of cellular and fibrous texture; the wood or fibrous portion of cellular texture and closely compacted vessels traversing the cells in a longitudinal direction, and symmetrically arranged, so as to form concentric and divergent or convergent layers; and the pith, which occupies the central portion of the stem, of a light spongy cellular tissue.

“The development of this apparently intricate organisation from the simple elements of cell and vessel, according to the principles already laid down, may be conceived to take place in the following manner:—Let us suppose a complete circular range of secondary vesicles becoming dilated by the process of growth in the interior of a primary or generating cell; it is evident that the envelope of this cell, pressed at all points of the circumference by similar parts, which are growing at once in length and breadth, will take the form of a cylinder; but it is also

evident that the secondary vesicles will be more compressed towards the centre than at the circumference, and that, consequently, a transverse section will exhibit each of these secondary cells in the form of a wedge. If eight vesicles grow in a longitudinal direction, without giving rise to other vesicles within them, we shall then have an organisation similar to that of the long stalk which supports the flower of the *Nymphæa alba*, or white water-lily—a monocotyledonous plant. Each of these vesicles will form an empty canal, of which a longitudinal section will present a three-sided prism, and which will extend from the base to the summit of the flower-stalk; but, if within each secondary cell a certain number of tertiary vesicles be developed, so as to form cells of a considerable size, and nearly empty, we shall then have the structure of the central part of certain trunks of the monocotyledons, and also that of the pith, as it occurs in some of the stems of the dicotyledons. Now if, instead of vesicles thus developed, parallel and concentric cells are formed, we shall have a commencement of concentric layers; and other vessels being developed in the interstitial spaces in a longitudinal direction, so as to form tubes or vessels, a transverse section will exhibit the perfect development of the concentric vascular tissue. If the cells, instead of loose hexagonal cells, give rise to other vesicles pressed one against the other, and developed on the coats of more internal cells, which are encased in, and line completely, the cavity of those in which they are formed, then we shall have the most complicated organisation of the stem of a dicotyledonous plant, with its encased and concentric layers and its medullary rays, which are nothing else than the interstices of the secondary cells, or rather the junctions of their sides, in which vesicles have been developed in a horizontal direction, forming tubes or vessels running from the centre of the stem towards the circumference.

“Branches are nothing more than the divisions of the stem, and may be conceived to be formed by the progressive development of cells and tubes in a manner altogether similar—a generating vesicle gradually developing other vesicles upon its internal membrane, and the growth taking place as in the former instance.

“Leaves consist of a cuticle or transparent film of cellular texture, enclosing a parenchyma or pulp, also of cellular tissue, and usually of a green colour, and fibres, of which the nerves and veins of the leaf are chiefly composed. These fibres communicate with each other, and are ramifications from the midrib. In the monocotyledonous plants, the nerves are for the most part parallel, or nearly so, extending from the leaf-stalk to the apex of the leaf in a longitudinal direction, and rarely branched, but communicating with each other by short transverse ribs,

which give the appearance of a tessellated or rectangular net-work to the vascular structure. In the acotyledons, the leaves or leafy expansions are destitute of ribs or veins, and consist merely of a pulpy cellular tissue, enveloped by a cuticular expansion. The development of these parts from the simple vesicle or cell may be thus supposed to arise:—Upon the internal surface of the envelope of a primary cell, two secondary vesicles may follow the growth of the generating or primary cell, and stretch out longitudinally; they will thus form two lateral lobes, whose interstice will be the median nerve. If other vesicles be developed within these two cells, and become in their turn large tertiary cells, their interstices will form the lateral nerves, and will seem to derive their origin from the median nerve. Other vesicles may, in the same way, be developed into cells in each of the tertiary cells, and others again within these, and so on indefinitely; and a primary microscopic vesicle will be thus transformed, almost before our eyes, into a leaf of a dicotyledonous plant. At the same time that this development of the cellular texture of a leaf is going on, a vascular connexion with the sap-vessels of the branchlet to which it is attached may be formed through the medium of the hilum, or point of attachment of the primary cell, and with this again throughout the leaf, by the hila of the secondary, tertiary, and succeeding orders of the cells, the interstitial spaces which form the nerves becoming vascular, in consequence of the development of elongated cells or tubes through these points of attachment.

“The structure of the floral coverings is analogous to that of the leaves; but the variety and elegance of their external forms, and the beauty of their colours, are such as to excite our deepest admiration. The stamens and pistils, or those parts which are more immediately concerned in the process of fructification, and for the preservation and due elaboration of which the more conspicuous parts of the flower are destined, consist, apparently, of cellular texture only.

“The most important part of the fruit is the seed. This organ consists, at least in the flowering plants, of an embryo, or the rudiments of the future plant, and various envelopes, generally two, sometimes three or four. The essential parts of the embryo are, the *plumula*, or young plantlet—the radicle, or future root—and the cotyledons, or seed-lobes, destined for the nourishment of the other portions in the first stage of their growth. Another important part of the seed, though not discernible in all plants, is the albumen—that which forms the principal part of the seed in the *Cereales* and grasses, and which, in one of this tribe—the *Triticum hybernum*, or wheat—is of such vast and incalculable importance to the welfare of the human race.

"The primary divisions of the vegetable kingdom are characterised by these peculiarities in the structure of the embryo. The distribution of plants, however, according to this arrangement, is very unequal. Of about 44,000 species known to exist, 38,000 are flowering-plants; of which number 32,000 are dicotyledonous, and only about 6,000 monocotyledonous. The remaining 6,000 are cellular plants, and destitute of cotyledons, the structure of their seeds being, indeed, from the extreme minuteness of their organs, very little known, and probably altogether different from that of the seeds of vascular plants; they are, perhaps, more analogous to bulbs than to perfectly formed seeds."—*Dr. Streeten's Lecture. Wor. Nat. Hist. Soc.*

ON THE CHARACTERISTICS OF FOREST-TREES.—"Artists but in very few instances excel in portraying trees so as they can be identified, without there is some good-natured description added. Drawings and engravings of trees, even by eminent men, are so destitute of character, that they may pass for any or every tree of the wood; and, what is even worse, figures of trees are sometimes delineated that have never yet been seen on the face of the earth! If, indeed, we except the works of Gilpin and Strutt, we find our native illustrated literature very barren upon the subject. While thousands have dilated upon the effects of light and shade, and the advantages or disadvantages of a blue or muddy sky to the pictures under their critique, they have been altogether indifferent as to the characteristic features presented by various trees, and the differences exhibited by the rigid tortuosity of the oak, the cumbrous uniformity of the elm, the lofty and majestic bearing of the ash, the umbrella-like form of the sycamore or beech, or the thousand vivifying and latticed wiry sprigs of the dependent lime, letting in the mellow sunbeams as through the traceried interstices of an oriel window. Strutt, indeed, has admirably depicted many of our forest-trees in his '*Sylva Britannica*' and '*Deliciæ Sylvarum*:' these are works of which we may be justly proud. Many, too, of Westall's '*Views on the Thames*' represent waving willows not to be mistaken; but the subject yet remains to be treated in a scientific and botanical manner, with regard to our indigenous trees.

"Every tree has some peculiar character, which, though perhaps at first difficult to describe, is at once caught and recollected by the eye of the observant naturalist; so that whatever difficulty he may have to make out the trees of the landscape painter, he has none with those of the real landscape itself. The funereal yew, the bending willow, and the sturdy oak, will occur to all. This '*physiognomy*' of vegetation depends, generally speaking, on a very few peculiarities;—of these the

most obvious is the mode of branching, or ramification, of a tree or shrub. The importance of this characteristic is so perceptible, that, even in winter, trees may be distinguished by it; and the observer of nature needs not the foliage to perceive the striking difference between a poplar, an oak, a beech, or a willow. The branches of the Lombardy poplar form acute angles with the main stem; both are straight, giving the tree a pyramidal appearance, which, in contrast with others, renders it ornamental in plantations. The weeping willow, on the other hand, 'stooping as if to drink,' if in its prime of beauty, gracefully waves its tresses over the ruffled waters, or, as an old pollard on the bank of the stream, looking like a giant, with huge distorted head, cannot be mistaken. The beech, darting round its convoluted spokes in irregular order, with its wiry branches and smooth bark, forms another character; while the gnarled and knotted oak, stiff, rigid, and motionless even amidst the most furious blasts of winter, merely moans a gruff defiance to the storm.

"It is important to notice these graphic outlines traced upon trees, because, as Baron Humboldt has well observed, 'it is vegetation that principally characterises the features of a country, and distinguishes it from another.' The granite rock, the basaltic column, and the limestone ridge, are the same in Iceland and Sweden as in Mexico and Peru; but who could mistake the vegetation of the two regions? Even animals seldom appear in quantities sufficient to give a feature to the scene, and their continual restlessness removes them from our view; but *trees* affect our imagination by their magnitude and stability, *flowers* by the brilliancy of their colours, and *herbs* by the freshness of their verdure.

"If trees have their distinguishing characteristics even amidst the gloom of winter, how much more their varied effect when clothed in the vivid umbrage of summer! This, indeed, is noticeable by all who have an eye to appreciate sylvan scenery, and is frequently alluded to by poets. Some, as the willow, are 'wannish grey;' others, as the *Populus alba*, silver white; of deeper green the elm, and deeper still the oak. Numerous other trees might be mentioned, more or less obviously claiming the attention; but all are familiar with the silvery feature given to a landscape, where the waving willows of the brook predominate, and are agitated by the wind. Compare the gloomy aspect of a pine-forest, or even of a single pine or fir, recognisable over a country for miles, with the splendid party-coloured and golden umbrage of the beech in autumn. The forest scenery of Great Britain presents features most interesting to the lover of nature; and, without

studying such scenes, no just ideas can be acquired of the beauty of our woods and forests.

"But it is not only the beauty of the various hardy trees which now adorn our country, and enrich our sylvan scenery, which should demand attention and care; it is also the great value and national importance of forest-trees to a maritime country. The oak is the glory of our woods, and, for the construction of our 'wooden walls,' maintains our glory among surrounding nations, while it wafts to us commercial wealth and greatness. The late Lord Collingwood was so sensible of the national value of the oak, that he never walked out in the country without scattering a handful of acorns, leaving them in the hope that they might one day rise to be useful in the navy."—*Analyst*.

NOTICES OF BOTANICAL PUBLICATIONS.

EDWARDS'S BOTANICAL REGISTER, continued by Professor Lindley. The October number contains:—

1. *Myanthus Deltoideus*. Triangular-lipped Flywort. This very handsome-flowering orchideous plant "makes the fourth species of the genus, and, in all probability, many more will be added. It is a native of trees in the neighbourhood of the great waterfall of the Demerara river, where it was found by Mr. Joseph Hubbard, who sent it to his friend, Mr. Booker, of Liverpool, by whom it was presented to R. Harrison, Esq., of Aigburgh. To the latter gentleman," adds Dr. Lindley, "I am indebted for the fine specimen represented. Its distinction from the other species resides in its lip, which has none of the fringe-like hairs of *M. barbatus* and *cretatus*, but is flat, of a thick fleshy consistence, and of a rich purple colour, with a dash of green on its centre." Some doubts have been entertained whether *Myanthus* should be a separate genus; but, as there are now four distinct species, (including *Catasetum cristatum*,) they should be kept as a separate genus. This plant, like its allies, requires a warm damp stove.

2. *Cratægus Aronia*. The Aronia Thorn. It is very near *C. Azarolus*, of which, indeed, it might be considered a mere variety, if it were not so much more hardy, nearly destitute of pubescence, and constantly furnished with two stones in its fruit: in the true Azarole there are five.

This species is, next to *C. Maroccana* and *heterophylla*, the largest and most like timber of all thorns. It grows very fast, makes a handsome head, and, on account of the great quantity of apricot-

coloured fruit with which it is loaded in the autumn, is a suitable ornament for lawns in pleasure-grounds.

3. *Epidendrum æmulum*. Emulous Epidendrum. A very rare little orchideous plant, closely allied to the variable *E. fragrans*, from which it is distinguished by its gouty stems being exactly oval—by its more leathery, less acuminate leaves, and very much smaller flowers, the petals of which are the same width as the sepals. It is a native of Para, whence it was introduced by R. Harrison, Esq., with whom it flowered in 1834.

4. *Pentstemon heterophyllum*. Various-leaved Pentstemon. A hardy herbaceous plant, belonging to the natural order *Scrophulariaceæ*; a native of California, where the seeds were collected by Mr. Douglas. It is propagated either by cuttings or seeds, and thrives and flowers well in borders of common garden soil.

5. *Escallonia illinita*. Varnished Escallonia. A South American evergreen shrub and genus, giving a title to the natural order *Escalloniaceæ*, of which it is the type. "It is," says Dr. Lindley, "by far the most hardy of the many species of *Escallonia* at present in our gardens, and is not unlikely to become a common shrubby plant. If this should prove so, the pale green of the leaves, their varnished appearance, and the peculiar habit of the plant, will render it a valuable ornamental species, notwithstanding the want of beauty in its greenish-white flowers." The most showy of this genus is the *E. Montevidensis*, which is also nearly hardy. It, in the flowering season, August and September, is usually covered with hundreds of hemispherical heads of clear white flowers, over which countless insects keep up a musical hum as they flit from flower to flower in quest of honey. "As one looks at these creatures, enlivened by the warmth of a bright sunny day, one cannot but admire the exquisite beauty of the ball-room that nature thus provides for an insect festival."

6. *Scaphyglottis violacea*. Violet Boatlip. A very inconspicuous genus, belonging to *Orchideæ*. It is a native of Demerara, whence it was imported by Messrs. Loddiges. The flowers are purple, and very minute; more a botanical rarity than anything else. It was formerly called *Cladobium*.

7. *Cytisus Æolicus*. Æolian Cytisus. A new cytisus from the island of Stromboli, in the Mediterranean. It was raised from seed by the Hon. W. Strangways, at Abbotsbury, in Dorsetshire, at which place it flowered for the first time in England, in May last. It is expected that the blossoms will become handsome and more numerous as the plant grows older. The flowers are congregated on an erect kind of spike; and though they have the colour, they have not the elegant

position of the common laburnum. Dr. L. thinks it may be hardy enough to stand our winters, if trained against a south wall.

8. *Lapeyrousia anceps*. Two-edged Lapeyrousia. An herbaceous plant, bearing rather pretty pale-blue coloured flowers; belonging to *Irideæ*. It is a native of the Cape of Good Hope, and has borne several generic names by different authors, but is now settled as above. It is usually cultivated in the greenhouse, but will thrive perfectly in a cold frame, well-drained in winter, and exposed on a south aspect in summer. It flowers in June and July, and ripens seeds about October.

SWEET'S BRITISH FLOWER-GARDEN, continued by Professor Don. The October number contains:—

1. *Rosa lutea*; var. *plena*. Williams's Double Yellow Brier. An interesting variety, raised about ten years ago by John Williams, Esq., of Pitmaston, near Worcester, from seeds obtained from the single yellow rose, which but very rarely matures its seed in this country. Among the seedlings raised at Pitmaston, three proved to be double, one of which is the present subject, which, from its flowering freely, and from the size, form, and colour of its blossoms, is justly esteemed a most valuable addition to our collection of hardy roses. It may be increased by layering, or by being budded upon stocks of our native roses.

2. *Nierembergia phœnicia*; var. *rosea*. Pink-flowered Nierembergia. A genus belonging to *Solaneæ*. A great variety of hybrids have been lately obtained from the intermixture of *N. phœnicia* and *N. nyctaginiflora*, and all of them proving fertile, and yielding seed much more abundantly than *phœnicia*. The present variety was raised by Mr. Rogers, at Battersea, where the drawing was made. It grows and flowers freely in the open borders.

3. *Centaurea balsamita*. Costmary-leaved Centaurea. A hardy herbaceous perennial, belonging to *Compositæ*. It is a native of America, and was collected there by Szovits, and sent by Dr. Fischer, of St. Petersburg, to Mr. Anderson, of Chelsea Botanic Garden, who raised and flowered it last year. It is of a coarse-looking habit.

4. *Lupinus macrophyllus*. Large-leaved Lupine. A tall robust perennial herb, the whole clothed with copious pubescence. It is a highly ornamental plant, as all the lupines are, and well deserves a place in every flower-garden. It is nearly related to *L. polyphyllus*, but is in every respect a much more robust plant.

PAXTON'S MAGAZINE OF BOTANY. The number for October contains :—

1. *Heliconia Braziliensis*. This genus belongs to the natural order *Musaceæ*, and, like its congeners, is adorned with very ample foliage, and very magnificent flowers. Nor are the flowers of this species fugitive; they remain in perfection for a fortnight or three weeks. The prevailing colour is bright scarlet, relieved by yellow and white, disposed in an erect spike; the stem and spathas being scarlet, bearing bisexual flowers in their axils, the corollas of which are yellow and white.

The *Heliconias* require a strong stove-heat, and are propagated by division.

2. *Collinsia bicolor*. A hardy annual, discovered, and seeds of it sent home from California, by the late Mr. D. Douglas. When sown in the autumn where the plants are intended to produce their flowers in the succeeding spring, nothing can surpass the richness its masses of cheerful bluish-purple and pink flowers present. The *Collinsia* succeeds the bed-flowers in coming forth, and then most seasonably, as but few other annuals are in flower.

3. *Mimulus cardinalis*. A hardy herbaceous plant, growing from four to six feet high. Another of those fine plants introduced from California by the lamented Douglas.

Seeds may be sown in autumn, or early in the spring, and the seedlings, nursed in pots of loam and leaf mould, will flower and ripen seeds in the summer and autumn. The plants require protection during winter in a dry greenhouse or frame, and, when growing freely, require plenty of water. The flowers are remarkably showy—scarlet and yellow, varied with dark purple lines near the eye.

4. Descriptions and cuts of the following esculent tubers, viz.—the Sweet Potato (*Convolvulus batata*), the Yam (*Dioscorea sativa*), and the Winged Yam (*Dioscorea alata*), extracted from "The Library of Entertaining Knowledge."

5. An extract, showing "the relation of vegetation to seasons," from the part *Botany*, published under the superintendence of the "Society for the Diffusion of Useful Knowledge," attributed to the pen of Dr. Lindley.

6. Descriptions and figures of some implements used in gardens.

7. Description and culture of the *Hibiscus rosa sinensis*.

8. On the culture of the *Campanula pyramidalis*.

9. A botanical description of the natural order *Combretaceæ*, together with a list of new plants figured in the leading botanical publications, and operations to be done in October among collections of plants.

CALENDARIAL MEMORANDA FOR NOVEMBER.

KITCHEN GARDEN.—It is no use for us to use the imperative mood in putting down our remarks on the present occasion ; it will be more agreeable to state what we are assured every good gardener has done, or is about to do, before the hard frosts of December set in. In the first place, he has secured his cauliflower plants intended for the early crops of next May and June, either under hand-glasses, or in frames, or pricked out in narrow beds on south borders, to be covered occasionally by hoops and mats. If slugs harbour among them, they are dislodged by sprinklings of lime-water. The remains of the Michaelmas crop of heads will be drawn and placed in safety before the end of the month. The first sowings of Charlton peas and Mazagan beans were probably put in last month, and second sowings may be put in before the end of this. Full crops of spring cabbage have been planted. Winter spinach is kept clean and properly thinned. Celery is finally earthed up. All the different sorts and ages of broccoli have been guarded against wind and frost. Blanching of endive is continued, and a good lot secured for winter consumption. Lettuce is managed in the same way. Artichokes, asparagus, and sea-kale may receive the autumn dressings. If any of the last is intended to be forced, now is the time to begin. Mushroom-beds will require constant inspection, to see that a regular heat is maintained. All culinary tubers not yet raised for storing, should not be left in the ground after the middle of this month.

FRUIT-TREES.—If any late sorts of pears or apples are still on the trees, they must now be gathered, lest they be caught by sharp frost, which now may be expected. This is still a good season for transplanting all sorts of trees, rooting out old or worthless sorts, and replacing them with young and better kinds. Pruning all descriptions of fruit-trees, except peaches and nectarines, may now be proceeded with ; and these named should have their young wood unnailed, to remain all winter at a distance from the wall. Business of this kind, done at this season, particularly the smaller fruits, allows the ground under them to be dressed, if necessary, and digged and laid in order for the winter.

FLOWER GARDEN.—This is a busy time in this department ; planting bulbs and tubers in their several beds ; taking up Dahlias, Marvel of Peru, and all tubers or roots which will be in danger from frost ;

reducing overgrown stools of hardy herbaceous flowering plants; pruning shrubs, &c. By these various operations the clumps and borders will be in readiness to be digged over, and got into slightly trim during the hard season.

COTTAGE ECONOMY.

NOVEMBER.

“**BEEES.**—Attend to the directions for last month, and keep the hives dry. It has been proved by experience, that bees which are kept very warm by covering the hives, consume eight pounds of food more than is consumed by bees exposed to the natural changes of the weather. If a certainty exists of there being plenty of food in store, there is no objection to covering and keeping warm, as it will tend to hasten the swarming, perhaps, a week or ten days.

“**GARDEN.**—Gather carefully any apples or pears which may yet be on the trees. Commence pruning gooseberries and currants. Remove the earth from around their stems, (taking care not to injure their roots,) and throw it to some distance, filling up with fresh soil from another part of the garden:—this will assist to check the caterpillar.

“Cut down and remove all decayed haulm or stems preparatory to digging, when the weather permits. Prune and nail fruit or flowering plants, collect manure, and prepare rich composts for different sorts of bed or border flowers. Rough-dig all vacant ground. The early sorts of peas and beans may now be sown; but, unless the soil be light and dry, it is better to delay these sowings till January. Cabbage may still be planted, and finish earthing up all crops requiring such care. See that your winter store of potatoes are well secured against frost; and if any carrots, parsneps, or mangle wurzel be still in the ground, let them be raised and laid in a dry place for winter use: the ground they occupied may then be rough-digged or trenched, to lie the winter.”

REMARKS ON THE WEATHER.

EVER since our last report of the state of the weather as experienced about London, it has rained, more or less, every day up to the 20th instant, with some intervening night frosts, which have tarnished some of the most tender things. The weather, indeed, has been more like that of November than October; and, from accounts received from the eastern and northern parts of the three kingdoms, wet and tempestuous weather has been very general. The south coast of England, including Devonshire, Dorsetshire, and Hampshire, has escaped this ungenial weather until very lately; for there, while travellers were annoyed by dust, constant and heavy showers were falling everywhere to the eastward. The equinoctial gales have, however, been severely felt, it seems, all over the country, and much damage has been sustained, as well in the orchards as among forest-trees.

Vegetation has been kept progressing by the wet weather, and it is to be feared that the bearing-wood of fruit-trees will not be so perfectly ripened as could be wished. The *Aurora Borealis*, which has been visible for this week past, portends, it is said, a *hard winter*, which, if it sets in suddenly, may be hurtful to vegetables produced during this showery autumn. These meteors, whatever they may portend, have appeared this season sooner by a month than they were expected by meteorologists, who have set down the 18th of November as the period when an unusual display of such phenomena may be expected to be visible.

Chinese Chrysanthemums, out of doors, are just beginning to open their flowers; but, unless the weather continues warm and dry, as it is now comparatively set in to be, a fine bloom can scarcely be expected. The late inclement weather has also been much against the blooming of Dahlias, and much disappointment has been felt at the different public shows of these fashionable flowers.

October 24th, 1836.

PAXTON'S
HORTICULTURAL REGISTER,
DECEMBER, 1836.

HORTICULTURE.

ON THE IMPROVEMENT OF GRAPES BY CROSS IMPREGNATION.

EVER since the practicability of impregnating one plant with the qualities, forms, and colours of another by a manual transference of the pollen has been discovered, many valuable results have been accomplished in the obtainment of many improved fruits, and flowers, and culinary vegetables. A few pears, several strawberries, a good many apples, and a multitude of gooseberries, have been added to our lists; even new varieties of the pine-apple have, by these means, been procured; and there is no knowing to what length the art of cross impregnation may yet be carried, more especially in the further improvement of our cultivated fruits.

There have been fewer attempts to improve our stock of grapes than of other descriptions of fruit. True it is, we have already a very numerous list, amounting, perhaps, to nearly, if not quite, three-score varieties of the cultivated grape. The principal part of these have been obtained, at different times, from foreign countries; and it is probable that several have been obtained from seeds ripened in this country, or from imported fruit, the seeds of which vegetate readily, and without any particular care. We remember once seeing a fine birth of seedling vines which had sprung up on a gravel walk from seeds thrown out of a housekeeper's room-window, but which were destroyed as weeds.

But, however readily vines may be raised from seed, it does not follow that superior varieties may be so obtained, or even so good as

the parent tree, except by the chance admixture of the pollen of superior sorts which were growing near and in flower at the same time. It is probable, therefore, that if pains were taken to form an union of those properties which distinguish the different sorts now in cultivation, new varieties, partaking of both properties so brought together, might be an improvement.

But what are the properties of grape-vines? We answer, hardiness for training in the open air, prolificacy, size of bunches, size of berries, high flavour, juiciness and melting character of the pulp; to which may be added, earliness in arriving at perfection.

Hardiness, in this northern climate, is a valuable property of a vine, because it is only in our finest and warmest summers that grapes ripen so as to be at all eatable. The very earliest, as the Sweet-Water, the Burgundy, and Miller's Burgundy, and a few others, can only be depended upon to ripen on open walls, a majority of the superior sorts rarely arriving at passable ripeness without the assistance of fire-heat.

With respect to those hardy and early sorts, it should be the object of the improver to give greater size of bunches and berries to the Burgundy, and higher flavour to the Sweet-Water, by matching the first with the Hamburgs, the Lombardy, or the St. Peter's, and the second with the Frontignans or Muscats. Intermediate progeny would probably inherit the earliness of the first, and the amplitude or flavour of the second varieties.

Some varieties of grape-vines are more prolific than others under the same circumstances of age, soil, situation, temperature, and general management. When a rank of vines in the same house are all equally thrifty as to growth, and sharing equally all the necessary appliances of air, light, and heat, so that their bearing-wood shall be all well and perfectly ripened, yet, in this case, we shall find that the trees are not equally prolific. While the Black Hamburg presents us with two, three, or even frequently four bunches from each eye that bursts, the Lombardy shows only a comparatively small number of bunches sparingly scattered over the whole tree. The same defect is often noticed in the bunches themselves, some sorts of grapes setting and swelling-off every berry, as we see in the Black Hamburg; others with half the berries diminutive and seedless, as exemplified in the Sweet-Water when forced, the Black Lisbon, and the Damascus.

Various opinions have been advanced accounting for the cause of these defects; but it is most generally attributed to the imperfect state of the sexual organs, and chiefly of the non-bursting of the anthers, by which a too-small quantity of pollen is distributed, and consequently the germens remain unfecundified. This is satisfactorily proved by the

practical fact, that, if the healthy pollen of other flowers be dusted over those which are liable to set imperfectly, it will cause them to set well. By this means an intelligent correspondent (Mr. Bristol, whom we should be glad to hear from often) effects the perfect setting of the bunches of the Black Lisbon grape, which, without such manipulation, seldom sets its fruit regularly. If, indeed, this irregular setting of the bunches arises from any defect of the male organs, the practice of borrowing healthy pollen from other trees is a good contrivance, and may be extended to all shy-bearing fruit-trees in houses or out of doors. We may remark here, that vines flower more vigorously in the open air than under glass; and it may be assumed that allowing forced vines a greater share of fresh air than is usually allowed at the time of flowering would tend to prevent the failure of many of the flowers. But it must be remembered that, at the time when vineries are in flower, the weather is inclement, and admitting air at that period would jeopardise the flowers in another way, besides counteracting the purpose of cultivating the trees under glass.

To improve, then, those varieties which are liable to fail in setting their fruit, endeavours should be made to impregnate their flowers with the pollen of some free-setting sort, in order to impart a new vigour to plants which may be raised from their seeds. Whether this process be tried or not, it is well to know that the first step in it will certainly improve the bunches operated upon.

The size or weight of bunches is a much-valued property of a vine; even if the flavour of the fruit be inferior, a noble bunch of grapes, whether upon the tree or table, is an inviting and beautiful object. We have many varieties of richly-flavoured grapes, but of diminutive size both in bunch and berry. Cross impregnation between the largest and smallest varieties would give a fair chance of originating an intermediate variety combining the properties of the extremes. The same observations apply to the size of the berries; and it would be a fine result if the berries of the Burgundy could be advanced to the size of those of the Hamburg, (and equally loose on the bunch,) or the fruit of Frontignans made to approach in bulk those of the Muscat of Alexandria.

The flavour of grapes is everything: some are almost insipid, as the Syrian; others simply sweet. Some have a high vinous flavour, as the Tokay; others again richly sweet, with a musky savour. It is very probable that, as there is so much variety in the flavour of our different sorts, this property may be as easily transferred from one to another as any of their other distinguishing properties.

The consistence of the pulp of grapes, as well as the thickness or

thinness of the skin, are different in the various sorts. In some, the pulp is firm, and what may be called fleshy: in others, soft and melting, dissolving quickly in the mouth. The last, provided the flavour be rich and agreeable, are most esteemed; and if, at the same time, the skin be thin and pellucid, such fruit are as near perfection as can be imagined.

The above are the different characteristics of the grape-vine and its fruit; and, differing from each other so much as they do, it is worth the consideration of cultivators whether an amalgamation of any two of the varieties would be a desirable improvement and valuable addition to our present collection. Although it be impossible for us to know which was the original kind of grape, we may rest assured that the different varieties now in cultivation, like varieties of other fruits, have originated accidentally by the intermixture of their pollen, for we are not aware of any other agent which could cause such changes of qualities, forms, and colours, as obtain in our vineries at home, or in vineyards abroad. If, then, such changes take place by accident, surely a little manual assistance could not fail to accomplish similar results.

The late ingenious Mr. Sweet found, in the course of his practice, that, though many exotic plants flowered in the collections under his charge, they seldom ripened seeds, without manual assistance, in close houses, there being neither wind nor bees to disperse the pollen. This is exactly like Mr. Bristol's practice, already alluded to, in assisting the setting of the Black Lisbon grape, and is mentioned to show that, if the transference of pollen affects one thing, it may also affect others, as above recommended.

But, How are we to proceed in it? is a fair question. We would say—suppose, for instance, a Black Hamburgh and a White Sweet-Water grow close together—no uncommon circumstance—and that they are in flower at the same time; let two of their respective bunches be brought into close contact, and, while in flower, be frequently shaken against each other, so that an intermixture of pollen takes place. These bunches should be allowed to become thoroughly ripe before they are gathered, and, when eaten, the seeds should be saved and dried. They should be sown in a shallow portable box, or in a seed-pan, in January, and placed in hotbed heat to bring them up as soon as possible; afterwards potted singly in small pots, and shifted into larger as their growth requires. This attention should be bestowed, to force them into fruiting-bulk with the least delay; and, arrived at this stage, may be either tried in pots in houses, or planted against a south wall till their merits be proved, or the effects of the experiment ascertained.

This would be an amusing process to a gardener who has leisure and opportunity to make this or similar trials, and to such we recommend it as worthy of notice.

ON THE SHANKING OF GRAPES.

WE have had in our previous numbers, during the last and present year, a good many excellent papers on this defect in grapes from various correspondents. With these, our friends, we might have been well content to have left the subject; but a case of shanking, to a rather serious extent, having fallen directly, and rather painfully, within our own knowledge, we are constrained to give the details, in order to show how very near our own conclusions come to those of our experienced correspondent, Mr. Stafford.

An old vinery, in the neighbourhood of London, built and heated by fire-flues in the usual manner, had remained for the last twelve or fifteen years very unfruitful. If forced early, there were never any fruit to speak of; and, if fire was not put to till the month of March, the return was still scanty. The owner was every year disappointed, and the gardener was sadly annoyed by seeing his master's table supplied from vineries in the neighbourhood, or, as it often happened, from Covent-Garden market.

Many opinions were given as to the cause of the failure: one thought the smoke-flues were insufficient:—immediately a hot-water apparatus was erected over them. Another thought the border in front was exhausted by cropping, and that a richer compost was necessary for the roots;—the culinary crops were instantly banished, and a thick layer of the richest dung was digged in, and heaped highly over the place occupied by the roots.

It was all to no purpose; defeat succeeded defeat, and the vinery was nearly given up by both master and man. The latter at last condescended to ask the opinion of an older head. His old friend first referred him to the healthy and fruitful state of his vines upon the open wall at each end of the vinery, which showed clearly that the trees in the house, when moderately or not at all forced, (which was sometimes the case,) had not fair play. He next told him to remove away all the rank dung and rich compost with which the roots of the vines had been so long buried, and fill up the cavity with road-sand, brick-rubbish, and leaf-mould, covering all with a thin mulching of decayed hotbed dung. His friend, moreover, told him to remove all the *stuffings of moss* with which the front door was sur-

rounded, as well as every crevice about the building, so that fresh air might freely enter at all times ; and, when he began forcing, to keep good fires, to enable him to give plenty of air at all times, to give health and strength to the trees.

All this was done two years ago, and last year the vines made great progress, and gave a fair sprinkling of fruit. This year they were still better, and the Hamburgs bore a full crop. Everything went on well till about three weeks or a month back, when, just as the family returned from a summer tour, (the vinery having been forced late, and the crop kept back, to meet the owner's return,) the gardener observed that *shanking* had commenced among the *thickest* of the crop of Hamburgs, but not among the same kind where the crop was moderate.

The old friend was again in requisition to account for the phenomenon ; but he could only shake his head, and admit, with Mr. Stafford, that it was inexplicable ; for, in this case, the trees are not young, so as to be wanting in that matured principle which one writer on the subject considers necessary to perfect fruit ;—it cannot be the cold and damp of the autumn, nor any difference in the soil or situation, because all the trees of the kind are not equally affected. Seeing that the most prolific trees are most hurt, it would appear to be a consequence of weakness, were it not that there are many perfectly sound bunches in the midst and upon the same shoots with the defective ones. The same objection applies to the assumed cause, an over-moist or steamy atmosphere, scalding, as it were, the footstalks of the berries, and causing them to shrink and die.

That the change from the acetous to the saccharine quality of the fruit is a crisis in the progress of the plant cannot be denied ; but this being a chemical rather than a physical change, requiring (one would think) a negative rather than any positive effort of the organization, we cannot conceive that a non-effort should cause debility. It is very feasible, however, to imagine that, as soon as the berry is perfect as to maturity, it ceases to require further aid from the system ; and it is likely, as Mr. Stafford says, a renovated action takes place in the growth of the tree, as soon as the fruit have ceased to demand their wonted supply of nutrition.

No one, we believe, has ever noticed the defect of shanking in the open air. Mr. Stafford admits this, and gives his reason how it happens that exposed vines are exempt from the malady, namely, their never arriving at that stage of maturity which subjects the bunches to suffer from a change of quality in the juices of the fruit. This may be so ; still the circumstance happening only under artificial treatment of

vines, goes far to induce the suspicion that the disease is somehow connected with our house-management.

We never saw shanking prevail in early-forced vineries; of this, however, we are *not quite certain*, and we should thank Mr. Stafford, or any other correspondent, to enlighten us on this point. We always noticed the Black Hamburgh to be most subject to this disease, particularly those grown in greenhouses, and consequently ripening late.

In a vinery we once had charge of, there were two vines which were had from Welbeck, viz. the Aleppo or Leopard grape (from its being party-coloured, black and white), and the Petro-Semina, a white-fruited variety, and generally yielding large bunches. Both were inferior-flavoured fruit, but good bearers, seldom failing, *except by shanking*, as were the bunches of a White Muscat of Alexandria in the same house; which latter, by-the-by, was in *too cold* a situation, to which we then attributed its failure, and that of the two others, to excessive crops.

At this moment, however, we are, like Mr. Stafford, bound to confess that we certainly know of no remedy, except only that which Mr. S. has proved to be of no avail, namely, *reducing the number* of bunches to ease the tree.

One of our correspondents (Mr. Dale, we believe) makes a distinction between *withering* and *shanking*. The former we have often noticed to occur at the points of the bunches, indicating a want of vigour in the system to mature the whole bunch; at least so we conceived it to be, though in this we may be also mistaken.

LANDSCAPE GARDENING.

LETTER EIGHTEEN.

It is somewhat remarkable that the approaches, the fencing, and the various domestic conveniences, platforms for exercise, and prospects from a lordly country seat, bear some resemblance to those strongholds which, in former and turbulent times, were found necessary as places of refuge and security to the owners. To be secure from hostile foes, moveable bridges, deep moats, embattled walls and ramparts, narrow portals, and massive gates, were all necessary to prevent a forcible entrance.

In the erection of those strongholds much ingenuity was necessary to ensure the safety of those within from the missiles of the foe without,

and at the same time to give the besieged every facility to annoy the besiegers. Thus the art of fortification became a principal part of the chieftain's accomplishments, and fortifications have been formed on the strictest mathematical principles, as well for defence as annoyance.

But very different indeed are the intruders against whom the landscape gardener has to oppose defences ; but, notwithstanding, it is perfectly true that he must have recourse to the same expedients to repulse a drove of cattle, as the military engineer has to repel and defeat a hostile phalanx of armed men. He fears no missiles, so that he need not study the law of projectiles : but still he must not suffer the inner works of his citadel to be invaded, and therefore he substitutes a ha ! ha ! for a moat ; a lawn for a glacis ; and, if threatening deformities of broken ground or buildings or nakedness of surface annoy, he covers them with his squadrons and detachments of trees.

In forming his approach, however, he acts upon the tact of a skilful general : he does not approach directly in front, nor yet in a direct line ; he winds *covertly* round, in order to take the citadel "in flank," and bursts upon it at the very place where he would think of "springing a mine."

I know not whether any castellated mansions in this country have ever had the outworks executed in such a manner as to correspond in some degree with the style of the building, but I will venture to assert that there are many which would be vastly improved by some dispositions of the kind, and without at all incurring the charge of *Uncle-Tobyism* upon either the owner or his landscape gardener. In fact, it is no more ridiculous to impose features of fortification which are *really useful* upon the ground, than towers and battlements upon a habitation never intended to be assailed, or, if assailed, could not withstand a discharge of "sparrow-shot !"

A castellated mansion upon a naked lawn, without any breast-work of turf or shrubs, is unnatural ; it is like the figure of a warrior without either shield or weapon ; and, even as a residence or habitation, it gives no idea of security from its station, nor idea of comfort from its stark-nakedness. A terraced base to a castle, as has already been observed in a former letter, is as necessary an appendage as are embattled parapets upon its walls.

The style of gardens best adapted for colleges or universities is certainly the Dutch style—that is, composed of avenues, level carpets of turf, and wide gravel walks. Meditation and study are interrupted by the view of various and varied objects, quick transitions, or change of scene. Such gardens accord well with the massive character of the buildings, and their regular compartments correspond with the regu-

larity of the architecture. Very fine examples of this style of gardening may be seen at both Oxford and Cambridge.

Public gardens are those attached to cities and towns for the amusement and recreation of the inhabitants, who support them by voluntary subscriptions. They may be either regular or irregular; for, as their purpose is only to afford pleasant pedestrian exercise, and the exhibition of beautiful and curious herbs, shrubs, and trees, it matters not whether their plan be regular for the sake of order, or irregular for the sake of variety. It is quite practicable, however, to unite these characters in public gardens, as the principal features may be symmetrical, and the subordinate parts may be as varied as pure and legitimate taste will allow.

In the arrangement of these gardens there are a few leading principles which should govern the designer in furnishing them, after full provision, in the first place, has been made for perambulation.

The vegetable kingdom is naturally divided into three descriptions of plants, on which one of the earliest systems of botany was founded. Tournefort's grand divisions were, *herbs*, *shrubs*, and *trees*; and, according to this classification, a public garden may be laid out in concentric zones, in either a semicircular, or circular, or rectangular area. But such an arrangement would be neither scientific nor satisfactory, because it is not quite practicable, inasmuch as there is really no natural distinction between a large shrub and a small tree; neither is it at all times, or in all cases, possible to say whether a suffruticose plant be herbaceous or shrubby.

If a later and more popular system be chosen to form the groundwork and character of a public garden, viz. the Linnæan, a symmetrical subdivision of the area into compartments for the *classes* and *orders* would only be necessary. This, I believe, has been already attempted in various places, particularly on the Continent, with various success. But such an arrangement, however systematically executed, would be "*behind the age*," as this celebrated system is in its last stage of existence, and gradually dying a natural death.

In our train of thought on this subject, we naturally arrive at the question, Can the Jussieuan system be moulded into the form and features of a public garden? It is "a consummation devoutly to be wished," because it would blend pure science with pleasant recreation; and, while enjoying the freshness and fragrance of both native and foreign plants, we should be, at the same time, imbibing pure draughts of botanical lore from a practical source.

There are two grand divisions, four classes, two subdivisions, three

sub-classes, and about two hundred and twenty orders, in the natural arrangement of plants. Numerically considered, these distinctions are no more than what an area of from eight to ten acres would, with the branching and inflections of the walks and paths, suffice to contain, supposing they were all hardy; and in a *botanic* garden, every such distinction should be ostensibly apparent, by divisions and subdivisions on the general face of the ground, and in the arrangement of the plants. But another question occurs:—

How far is systematic botany necessary in a public garden? I have already alluded to the probable advantages of such amalgamation; but I fear that, as in all gardens *the eye* must be delighted by harmonious associations, it would be impossible to create anything like harmony of gradation by the juxta-position of either the orders or genera of the Jussieuan system. Scientific associations yield a mental pleasure, and would delight *the few*, but would be unheeded by *the many*, if beauty of disposition were at the same time disregarded. This difficulty can only be obviated by planting in radiating lines from some common centre, and by accurate labelling. The great number of tropical plants which compose many of the Jussieuan orders renders it almost impossible to make a full display of the natural system in the open air in this country.

This fact has often suggested the idea of laying out a public garden *geographically*. Suppose a given piece of ground of any extent, and in shape a parallelogram, ranging east and west. Suppose this divided transversely into five unequal parts, to represent the five zones of the globe; and, for the sake of more distinct classification, let the ground be divided longitudinally into six parts, also unequal. A broad gravel walk may occupy the middle from end to end, at which are the principal entrance gates, opening under massive arches of rock-work. These arches and the spaces behind, though necessarily narrow, will easily hold all the mosses and lichens which are known to inhabit the frigid zones, or the remains of either animals or vegetables found within those limits, or on the immediate confines of the northern and southern temperate zones.

Suppose we enter at the east gate, our view is directly along the middle walk, thronged as it would often be by company, together with parts of the hot-houses, &c. On either hand would appear the hardy herbs, and shrubs, and trees, from the southern parts of the south temperate zone, namely, Australia, Cape of Good Hope, and South America; the herbaceous plants on the borders next the walk; beyond these the shrubs; and behind these last the trees, so as to form a rising bank of various foliage. This division, owing to the paucity of trees

from these parts of the world, would necessarily require to be backed with those from other climates, for the sake of uniformity.

Advancing onward, we may first arrive at a conservatory *bespanning* the walk, and of ample dimensions, for the preservation of all the most elegant plants indigenous to the countries on each immediate side of the tropic of Capricorn. Here would be placed all the finest genera and species from Australia, Africa, and South America, many of which should be kept in pots or boxes, to be moved out on the borders during summer.

From this building the visiter enters upon the middle division of the garden, containing the plants of the torrid zone. Here a glazed building, built in the form of a Turkish or Persian mosque, with its swelling dome, and minarets to serve for chimneys, may contain the palms, the musas, the pandanæ, and other remarkable tropical plants. In front of this palm-house there may be a basin for nelumbiums and other interesting aquatics from the warmer parts of the world; and the borders round the base of the building, and every vacant spot, should bear some kind of tropical plant, many of which do very well out of doors during our summer.

Next, beyond this the central division, we may enter another conservatory of similar dimensions as the first. Here we should find a collection of Chinese and other natives of the warmer parts of the northern temperate zone, and which, with South European plants around, would form a beautiful assemblage.

From this point to the western gate the ground on each side could be sufficiently stocked with European and North American beauties in the greatest variety, forming as handsome an amphitheatre-like bank of foliage as could be wished.

I have drawn but a faint outline of what a public garden so designed might be made; for, besides the plants, many natural productions might be introduced, to impress still more strongly new ideas of foreign scenery and foreign products.

On each side of the centre walk, and more especially within that division intended to contain the very small number of hardy trees and shrubs from the southern hemisphere, an irregular flow of turf might be introduced with good effect, and as well along the sides of the other paths and walks, which might be thought necessary for the sake of variety.

Shady walks along the sides and ends of the garden should also be formed for those visitors who might feel disposed to enjoy the shade and more seclusion.

Many improvements of this plan of a public garden would occur

to a clever designer in arranging the details. Placing the plants would belong to the geographical botanist. The architecture of the buildings should resemble the style of building of the countries whence the plants in and around them are brought, and might be extended into reading or coffee rooms, museums, &c. &c.

(To be continued.)

MISCELLANEOUS INTELLIGENCE.

SKETCHES OF NATURAL HISTORY.—The occupation of gardeners requiring them to be much in the open air, and as a garden is the constant haunt of a great variety of birds, insects, mollusca, and a few of the mammalia, every one therein employed must be more or less a naturalist, whether he makes these matters a particular study or not; and, as these various tribes of the lower creation are either injurious or serviceable to the gardener, it behoves him to know somewhat of the economy of these his constant or occasional visitants, so as to be able to ward off the attack of the destructives, and at the same time to cherish and encourage those which are really serviceable.

For this reason it is intended to admit occasionally brief sketches of the natural history of those birds, insects, or other animals which are most familiarly known in gardens, as matters not quite foreign to our main object, and more especially as we are promised the aid of two or three correspondents who delight in the study of natural history, and who think it wisdom "nature to explore."—ED.

Of the Redbreast (Rubecula familiaris).—Of all other small birds, this is one of the most common and best known; it is also one of our greatest favourites, in consequence of its bold familiarity and fearless demeanour in approaching the presence and habitations of man. In nidifying they are nearly the earliest of the small birds, choosing a hole in a wall, or hedge, or ditch-bank, or sometimes under the eaves of out-houses. They use a rather large mass of materials in constructing their nest; withered leaves and grass, feathers, and finishing with an inside lining of hair. The nest is not neatly formed, part of the materials being often left hanging from the front, which makes it easily discoverable.

The robin breeds twice in the year, rearing five or six young each time. The young are fed with small earth-worms and caterpillars, of which they devour great numbers. In this particular they are of great service in gardens. It is true that the young, as soon as they are driven

to shift for themselves, appear to be very fond of currants and raspberries, and, in taking a share of these fruits, the gardener has sometimes reason to complain. But the damage they do is very trifling; and these little pilferings are certainly very excusable, in consideration of the good they do at other seasons.

As a song-bird, the robin ranks neither very high nor very low. He has one qualification as a songster which no other British bird possesses: he sings the whole year round, except only when it is very hard frost. There is considerable modulation in his song, and some of the strains are very emphatic, and are given with such force, that his little throat seems as if it would burst. His song is not always that of love, nor is it the call of affection; for it is often made up of the impassioned shouts of defiance, or of ambitious yearnings to outdo the song or threats of a rival. His notes are not sprightly; they are for the most part plaintive, even while he vociferates his threats or challenges his antagonist; they have a kind of wailing cadence or shivering wintry tone even at midsummer. The young ones begin warbling before their first moult, but do not gain their full plumage or song till they are nearly twelve months old.

The bold and fearless spirit of this little bird has already been alluded to; and, besides, he is exceedingly pugnacious, always at war with his own brethren, and exercising a spiteful tyranny over all other birds, even those twice his size. Blackbirds and thrushes he drives from what he selects as his own dominion—a certain portion of the garden, near which he is constantly found. Here he nestles in summer, perhaps, and roosts in winter. This may be an ivy-covered tree or building, or other place of shelter, which he guards with vigilance till long after sunset.

Besides earth-worms, maggots, various insects, and small shell-snails, the robin willingly regales himself in picking a bone thrown from the scullery; or, if he gains access to the larder, he is by no means nice or shy in helping himself to whatever he may fancy, whether dressed or undressed. Crumbs of bread or cheese—in short, no kind of human food comes amiss to him if hunger crave.

The natural vigilance of the robin renders him useful to other birds which are the prey of cats, foxes, or hawks; for no sooner is one of these marauders observed, than he sounds his note of alarm, telling all to be on their guard; and it is astonishing to see with what alacrity all who hear the call fly to a place of safety. House-sparrows, chaffinches, tomtits, and other small birds, all rush to covert till the danger is past; and if in the fields a pole-cat, weazel, or stoat be seen by the robin, he certainly will tell of "his whereabouts."

There is another instance of the usefulness of the robin as a *pointer*, in showing by his action where a mole is at work. Whether a mole be running along an old tunnel, or forming a new one by throwing up the loose earth in a hill upon the surface, the worms, the natural prey of the mole, feeling his presence, try to escape from him either by sinking down to the bottom of their holes, or rising out upon the surface of the ground. These last are espied by the robin, who quickly riots in a full meal. Many a mole has been taken by the writer, who was led to the spot by this indication of their presence, afforded by the robin hopping about the place of the mole's operations or movements.

Upon the whole, the redbreast is a useful bird about a garden, and therefore should, by all means, be encouraged to build and breed within the walls and precincts. No fears need be entertained that they will become too numerous; their natural antipathy to each other, and love of sole dominion, will always cause their dispersion from any one spot. This circumstance reflects no credit on the personal character of the robin, for, though no one is more convinced that this little bird is a friend to the gardener, the truth must be told, however contrary to the general feeling in the robin's behalf. In a word, he is a bad neighbour—an unsociable and domineering relative to his own and every other tribe of small birds; his apparent confidence in man is audacity—his familiarity downright impudence.

Of the Wren (Anorthura troglodytes).—This is (except the gold-crested wren) the smallest British bird, and seems very equally distributed over the whole face of the country, wherever there are buildings, woods, or broken ground. They are entirely insectivorous, and in this respect are as useful in gardens as the robin; but their character is far more amiable, and they deserve to be cherished and protected wherever they have chosen to sojourn.

Innocent, industrious, and always sprightly, they are indeed at all times the very picture of vivacity. Whether seeking their own food, building their compactly-formed arched nest, or feeding their young, they are indefatigable—always in motion, and there is a briskness in their action which is highly amusing.

Soon as the first gleams of spring begin to awaken vegetation, the wren is one of the first to hail the return of the genial season. His sprightly strain, though short, is frequently repeated, and with such energy, that, though small and shrill his pipe, he makes the hollow woods resound. It is a song of love as well as of joy; and so peculiar, that it cannot be mistaken for that of any other bird.

Like the robin, the wren is also an alarmist if any enemy of the feathered tribes be in sight. To cats, stoats, or weazles, he is a most

determined tormentor; he hovers round the foe, uttering his peculiar *birring* note, which seems not only a note of fear, but of chiding reprehension.

His mode of courtship is one of the most amusing exhibitions that a naturalist can be witness to. No rational actor in pantomime can excel the wren;—urgent persuasion, the most tender vows, and the most seductive promises, are all exhibited in dumb show. Sometimes, indeed, he uses his own language of hope or flattery, but it is done in the softest whisper. The whole scene is truly ludicrous, for the little fellow swells and struts as majestically as the proudest turkey-cock!

The nest, which is beautifully constructed, resembles an egg, the smallest end downwards. It is completely arched over, the entrance being in the side, a little below the springing of the arch, so that neither rain can fall nor eye see into the interior of the building. This form of the nest requires that it can only be made against some perpendicular body—as the ivy-covered side of a tree or wall, or abrupt bank of a road or river.

The hen lays from ten to fourteen eggs before she sits, and hatches her brood in about fifteen days. The young are reared in this dark but secure cradle; and it is wonderful to see the assiduity of the affectionate pair while rearing their tiny brood. From dawn until sunset their efforts are unceasing; flying to and fro between the nest and the fruit or other trees in the neighbourhood, collecting small green caterpillars (*Tortrix*?) which destroy the flowers and foliage of trees and flowering shrubs. The numbers thus collected and destroyed in the course of one day are incalculable, as at every return to the nest the bills of the old ones are each charged with five or six writhing victims, which are quickly distributed to the importunate young.

Another remarkable trait in the domestic economy of the common wren is their extreme attention to cleanliness. In such a close apartment, with so many helpless inmates crowded together, it might be supposed that it would soon become intolerable to the inhabitants; but no such thing: the nest is kept as clean as a drawing-room by the instinctive cleanliness and tidy housewifery of the watchful parents.

In very hard frosts the wren has a severe struggle to maintain existence, as the insect tribes have then retired to their winter quarters, either in the crevices of the rough bark of trees, or holes in buildings, or other places of shelter. There the wren may be seen searching every crack and corner for winged insects and spiders, or their bags of eggs, which the wren appears very fond of; so that in summer and winter this little bird is ever reducing the swarms of insects, some of which are so destructive to garden crops. If in that season the wren gains

access into a greenhouse containing orange-trees infested with the scaly coccus or aphid, here the bird has a sumptuous feast, and, at the same time, performs a work of great service to the gardener.

Were it not for the wren, and other insectivorous birds, the despoilers of our summer fruits and flowers would, from their numbers increasing without a countervailing check, like the locusts in some countries, consume every green leaf and every embryo fruit ; so that it may fairly be adduced that those diminutive objects of the lower creation are an indispensable link in the chain of being, and as necessary in the grand scheme of Providence as are the larger beasts of the animal kingdom.

Of the Gold-crested Wren (Regulus auricapillus).—This is the smallest British bird, and, though constantly insectivorous, it does not frequent gardens ; nor are they so numerous as the common wren, unless there are many fir-trees in the neighbourhood ; for among firs, cedars, and other slender-leaved evergreen trees, the crested wren is mostly met with. Here they find abundant food, as flies of all descriptions resort to these thick trees for shelter from cold or rain. Here, too, this little warbler breeds, fixing its nest at the very point of a pendant branch or twig. In this position the nest is perfectly safe from squirrels, which would disturb, or birds of prey, to rob them of their helpless young : add to this, that the nest is of itself so small as scarcely to attract the notice of the keenest eye, it appearing only like a bit of green moss, somewhat larger than a hen's egg, attached by accident to the dangling twig.

When this bird visits gardens, he flits about among the gooseberry or espalier trees, picking up young spiders or other small insects. While so employed, he every now and then utters a short and feeble song, which has been aptly compared to that of a fairy. Field hedges he also visits for food or recreation, flitting along the leeward side, and alighting at intervals of a few yards, as if he were measuring by equidistant flights its whole length—never roosting or building in hedges, however, unless they are of yew or holly.

This bird is very generally distributed over the British isles, but, from its very small size and secluded habits, is not much noticed, unless the stripe of burnished gold along the head catch the eye. This is indeed most remarkable, as, perhaps, the feathers of no other bird represent the metallic lustre of gold so perfectly as it appears in this instance.

Of the Earth-Worm (Lumbricus terrestris).—None of the *Intestina* of Linnæus are better known to the gardener than the common earth-worm. They are described as naked, simple, without limbs ; segments one hundred ; twenty-six to thirty form the belt ; two spines on each

side of each segment, except the belt, all turned backward ; three pores on each side of the belt, two on the twelfth and two on the fourteenth segment ; living in the ground, and sometimes in the human intestines. In sex they are hermaphrodite, each individual being both male and female ; hence their wonderful fecundity. They lay a vast number of eggs, which, when first in motion, are like small white threads, about three lines in length, and attached to the under side of stones, or other solid body, on moist turf, or among any green herbage.

There are several species met with in gardens and elsewhere ; the largest is the dew-worm, so called from its exposing itself on the surface for sexual intercourse while the dew is on the surface, or during soft warm rain. The other species are all smaller ; one, of a middle size, is more slender, tougher, and of duller red colour than the dew-worm, and of which fish are particularly fond when presented as a bait. Anglers call this the "bramble-worm," as best suited for their purpose. The smallest species live in rich moist turf, and are known by some of their segments being of a green colour.

Their abodes in the earth are perpendicular holes, higher or lower, in which they remain according to the state of the weather. If moist and warm, they keep near the surface ; but if cold or dry, they descend to the bottom. It appears that they deepen their holes by swallowing the finest parts of the earth, and afterwards voiding it as "casts" upon the surface. In this action they are plagues to the gardener, by disfiguring his lawns and soiling his gravel walks ; but they can easily be dislodged from any given spot by soaking the ground with lime-water. The dew-worm is mischievous in another way—that is, by drawing to the mouth of their holes not only small stones or other light matters, but also young seedlings of some of the most precious crops. These are the only crimes or misdemeanors which can be laid to the charge of earth-worms ; but, after all, it is questionable whether either gardener or farmer could do so well without them. If it be an advantage to the cultivator of plants to have the ground open and porous, in this he is assuredly assisted by worms, for they form thousands of air and water ducts through the whole thickness of the staple of the arable soil, and consequently render it more suitable for the growth of plants.

This, however, is but a contracted view of the usefulness of earth-worms, for, considering them as one of the grades of animal existence, they are indispensable to many classes above as well as beneath them. They are the food of many birds, and of fishes when washed from the crumbling banks of drains, ditches, and rivers ; and they constitute the sole food of the mole, and an agreeable repast to the skulking hedge-hog and ravenous swine. So instinctively fearful of the mole are the earth-

worms, that the least concussion of the earth alarms and sends them either to the bottom of their holes below the tunnels of the moles, or writhing out upon the surface to escape. An angler in quest of worms for bait need not dig for them; he has only to take a kitchen poker, thrust it deep into a moist part of a meadow, and then, shaking it forcibly from side to side, so as to produce a disturbance around, the worms, if any near the spot, will come instantly to the surface to fly from what they conceive to be their natural enemy, to fall into the power of others equally merciless.

The tunnels of the mole are fatal traps to the earth-worms; the latter, in their progress either up or down in the soil, fall into these openings, and there remain till the next journey of the mole; for, though worms can make a passage for themselves, if buried in the soil, by muscular force exerted laterally, yet, when in open space, being without limbs, they cannot enter the soil again, unless they get among the stalks of herbage, to permit insinuation and to gain a purchase, to enable them to progress by successive movements of their head and tail parts.

If the earth-worm loses, by the spade or otherwise, a part of the tail, it is renewed again in the most extraordinary manner: the central canal of the body becomes gradually elongated backward till it reaches its former length, and this is, in time, covered with the outer integuments. As worms have no skin, or, if there be anything like cuticle, it is most sensitive, any caustic or pungent quality affects them dreadfully, so that a solution of common salt or lime kills them outright. Hot lime dissolved in water, when drawn off clear, may be applied to potted plants, or to grass or gravel walks, with the best effects in banishing worms.

OF THE TURNIP CATERPILLAR, called by Farmers THE BLACK JACK.—These insects seldom visit gardens, nor are they constantly visitants of fields; but when they do appear, they are, from their numbers and voracity, most destructive to the turnip crop.

They have made their appearance in many different districts of this country during the last summer, particularly in Cambridgeshire, where we have lately witnessed the effects of their ravages. Mr. W. Wool-lard, an intelligent farmer residing at Fen Ditton, in the neighbourhood of Cambridge, has paid particular attention to the economy of this insect, and his account of it is as follows:—

“In the month of May last the caterpillar first appeared upon a piece of field cabbage, but, from the substantial foliage and gross habit of these *drum-heads*, the insect did little damage. In about a month

afterwards another brood attacked the young turnips, then just ready to be hoed out. The insects commenced their attack *behind the hoers*, upon the best plants selected to stand, and in a very few days would have devoured the whole." Mr. Woollard, on observing this, immediately ordered the men to cease hoeing, resolving to allow the caterpillars a full feast, hoping thereby to save a share of the crop for his sheep. He was led to adopt this management from observing, that, as the insects came forth simultaneously on the turnips, it was probable their life as caterpillars would be short, and that the then existing brood would quickly vanish. In this surmise he was right; for, having kept some in confinement, he found that they continued ravenous and as caterpillars for from fourteen to twenty days, after which they retire beneath the surface of the ground, and very soon are changed into *chrysalidæ*.

In the chrysalis state they remain for a period of between two and three weeks, when they come forth as a hymenopterous fly, having a yellow breast and abdomen; corslet or body (to which the legs and wings are joined) black; eyes lateral, large, and black; wings diaphanous, with black veins, and a long marginal mark of the same hue on the outer side of each,

The fly preserved and presented to us by Mr. Woollard is somewhat mutilated, so that neither antennæ nor other members of the mouth can be accurately described by us; but there is a remarkable horn-like appendage, the remains of the antennæ, protruding from the front of the head. The fly is nearly half an inch in length, and has some distant resemblance to the yellow-bodied flies (*Scalophagi stercoraria*) which appear on recently-laid heaps of dung in gardens or fields. We will show the fly to some able entomologist, who may favour us with a better account hereafter for publication.

The manners and haunts of the perfect insects are yet to us unknown; but it is probable that, after sexual cohabitation and deposition of eggs by the female, they become food for swallows and other insectivorous birds, and soon insensibly perish.

But how can we defend our crops from their attacks? is the grand practical question. The discovery of this is the proper business of the entomologist, and the only use (besides rational amusement) of the study and knowledge of the science.

When they are plentiful in one season, it is likely they will abound in the next, unless some accident of weather proves destructive to their eggs during winter. As those noticed by Mr. W. appeared immediately after the hoe, it may be that the eggs are contained in the dung, and its exposure and comminution on the field brings them to life.

The gentleman to whom we submitted the foregoing account and specimen is decidedly of opinion that the insect is the *Athalia speciarum* of Leach and Fabricius; that their caterpillars are the favourite prey of ducks; and that a flock of these birds, driven leisurely over an infected field, would be the only practical means of removing the pest.

EXTRACTS.—“*Lolium* or Darnel is a very common grass, and several species, as the *arvensi*, *perenne*, &c., have been recommended to be sown among other grasses on poor soils; they afford a bulky crop of hay, and, although much less nutritious than the *fiorins* and various others, they are more so than the fox-tail, cock's-foot, dog's-tail, and fescue grasses;—and it is not unimportant for agriculturists to be aware, that experiments have shown some of the grasses to contain two or three times as much nutritious matter as others.

“The bearded darnel is generally supposed to be the ‘*Infelix lolium*’ of Virgil, of which he speaks in no measured terms of condemnation. It is not a very common grass in Britain, but in warmer climates it is a noxious corn-weed, and, with the barren oat, overtops and chokes the wheat; so that Milne thinks it highly probable that the Greek word, rendered *tares* in the thirteenth chapter of St. Matthew's Gospel, should be translated *darnel*, which would convey the meaning of the passage more aptly than *tares*, unless the *strangle-tare* (*Ervum tetraspermum*) be intended; for, of all corn-weeds, this is most annoying to a growing crop, though the seeds do not, or at least need not, appear in the sample, because they may be sifted out, which darnel cannot be. The same word is always rendered by French translators *ivraie*, from *ivre*, drunk. Our partiality for contractions has caused the corruption of the French *ivraie* into *ray*-grass—one of the names of darnel, although it properly applies to one species only, viz. the *Lolium temulentum*, which is said to possess intoxicating powers. Haller affirms that this species of *lolium* not only produces intoxication, as the trivial name implies, but that, if baked into bread, or fermented in ale, its administration is attended by very disagreeable effects;—it produces headach, vertigo, &c., and the tongue exhibits a very strong trembling. By the Chinese laws (for this plant is found both in China and Japan), it is forbidden to be used in fermented liquors. Some of the intoxicating qualities of factitious beer are said to be owing to the admixture of darnel with malted barley. In the “Medical and Physical Journal” there are placed on record several cases of poisoning by darnel in the human subject. In these, giddiness in the head, pain and swelling of the limbs, succeeded by abscess and gangrene, were the

most prominent symptoms. This, the only poisonous grass known, is easily distinguished by its two-sided spike and one-valved glumes, it rarely appearing but among autumn-sown crops, such as wheat and rye, but seldom among oats or barley. The darnel is often found accompanied by *Bromus secalinus*, or rye-grass, and they are often mistaken for each other even by farmers. But, while the last is as sweet and pleasant as oats, and eagerly devoured by cattle and poultry, the darnel is nauseously bitter, and refused by all.

"The genus *Panicum*, another of the grasses, is thought to have been one of the earliest grasses, the seeds of which were used for making bread, and that the names *panicum* and *panis* have, therefore, more than a mere etymological affinity. *P. miliaceum* (the common millet) is still sown in this country, and occasionally used for making puddings, as a substitute for rice, but much more frequently for feeding poultry. *P. arborescens* is an extraordinary grass, for, although the culm is not thicker than a goose-quill, it is said to exceed in height the loftiest trees in Hindostan, shooting through their branches, and overspreading their summits, as it were, with an aerial meadow.

"*Sorghum vulgare*, the Indian millet, is commonly cultivated as corn in Arabia and most parts of Asia Minor; it has been introduced into the West Indies as a hearty food for the slaves, and is there called Negro Guinea-corn. In the southern parts of Europe, as in Spain and Italy, it is likewise grown. The flour is white, and is made into loaves or cakes; but it is chiefly used for feeding poultry and cattle. It grows five or six feet high, is a handsome plant, and its long awns protect the grains from the rapacity of birds.

"*Reflections on the Study of the Cryptogamia*.—The Jungermannia are small obscure plants, growing in damp situations, creeping over the trunks of trees, the surface of rocks, or the moist earth, and seldom attract much notice. The monograph of Hooker upon the British Jungermannia has, however, elevated them from their obscurity, and shown these neglected plants to be among the most exquisite examples of Nature's works.

"None of them are poisonous or in the slightest degree hurtful; their taste is mild; some few, as the *G. pusilla*, are fragrant, but not possessed of any very sensible properties. Not one of the species has hitherto been applied by man to any useful purpose.

"The study of these plants has sometimes forcibly struck us as being a more decided proof of a disinterested love of science than the investigation of other richer and more directly rewarding tribes. The Jungermannia afford neither clothing nor fuel; they yield neither food for the hungry nor medicine for the sick. Hence they have been contemned

as useless, and their study proscribed as a useless occupation. But is it so? Are they altogether useless? Are there not functions performed by these, and many other plants *as worthless*, which are of vast importance in the general economy of nature—functions which indirectly, if not directly, minister to the comforts and conveniences of man? The uses which nature makes of plants are often more beneficial to us than any uses we can make of them ourselves; and should aught created be despised as useless by those whose ignorance alone it is that, in all likelihood, prevents them from discovering its utility?

“But there is use in studying the works of the Creator far beyond the discovery of the uses to which these, his creatures, may be applied; far beyond the discovery even of the blessings he has provided for our enjoyment; for, when they afford neither sustenance nor physic for the body, they yield both food and medicine for the mind. ‘Do not, therefore, depreciate a pursuit which leads man to contemplate the works of God.’ To the merchant, the courtier, or the book-worm, the journal of a naturalist may appear to contain memoranda of little importance; but to such, if they scorn his labours, he may answer in the words of Southey, that he has ‘in his pursuit, as they in theirs, an object that occupies his time, and fills his mind and satisfies his heart. It is at least as innocent as theirs, and as disinterested—perhaps more so, because it is not so ambitious.’ Nor can the pleasure he feels in the discovery of a plant, or in the investigation of its wonderful structure, be less pure or less worthy than what they derive from the perusal of the noblest productions of human genius—nay, is it not likely to be both more pure and more worthy?

“The *Jungermannia*, like other humble genera of the class *Cryptogamia*, are of much more importance than is generally supposed; they, with the lichens, fungi, algæ, &c., form the first earthy crust on the naked rock, and, after years of growth and decomposition, form at last a bed of earth for the sustentation of shrubs and trees. These plants and their immediate allies, which often appear to have so suddenly clothed a barren heath, or overspread a dry wall with verdure, have the peculiar property of remaining in a dormant state for a considerable length of time, and to revive from their parched condition, as if awaked from sleep, on the access of moisture, to all their pristine beauty, spreading abroad their delicate leaf-like expansions, and their beautiful apologies for blossoms.

“In elegance and delicacy of structure, mosses are not exceeded by any plants that grow; and an intimate examination of these minute vegetables would almost, if not altogether, lead the observer to believe that, however admirable Nature may be in every particular, yet that, in

excess of modesty, she veils her chief beauties from the vulgar gaze, and reveals them to those true lovers alone who are strictly wedded to her service and her study. Perhaps a higher tribute to their beauty was never paid than that which springs from the detail Mungo Park has given of the consolation and encouragement he received, in a period of great difficulty and danger, from the contemplation of the inimitable structure of one of those lowly mosses. As an illustration of the whole-some effect of the study of the works of nature on a well-regulated mind, the passage, though often quoted, cannot be deemed unworthy of repetition. This enterprising traveller, during one of his journeys into the interior of Africa, was cruelly stripped and robbed of all that he possessed by banditti. 'In this forlorn and all but hopeless condition,' he says, when the robbers had left him, 'I sat for some time looking round me with amazement and terror. Whichever way I turned, nothing appeared but danger and difficulty. I found myself in the midst of a vast wilderness, in the depth of the rainy season, naked and alone, surrounded by savage animals, and men still more savage. I was five hundred miles from any European settlement. All these circumstances crowded at once upon my recollection, and I confess my spirits began to fail me. I considered my fate as certain, and that I had no alternative but to lie down and perish. The influence of religion, however, supported me. I reflected that no human prudence or foresight could possibly have averted my present sufferings. I was indeed a stranger in a strange land, yet I was still under the protecting eye of that Providence who has condescended to call himself the stranger's friend. At this moment, painful as my reflections were, the extraordinary beauty of a small moss irresistibly caught my eye, (I mention this to show from what trifling circumstances the mind will sometimes derive consolation,) and, although the plant was not larger than the top of one of my fingers, I could not contemplate the delicate conformation of its roots, leaves, and fruit, without admiration. Can that Being (thought I) who planted, watered, and brought to perfection, in this obscure part of the world, a thing which appears of so small importance, look with unconcern upon the situation and sufferings of creatures formed after his own image? Surely not. Reflections like these would not allow me to despair. I started up, and, disregarding both hunger and fatigue, travelled forwards, being assured relief was at hand, and was not disappointed.'—*Bur. Bot.*

ORDEAL TREE.—This is an African tree, and in its habit and mode of flowering is allied to the Mimosas. It was first known to botanists as the *Afselia grandis*, but it is now the *Erythrophleum quincensis* of

G. Don. This is the Grege or Ordeal-tree of Sierra Leone and Guinea. The generic name refers to the red juice with which the stem and branches abound. This tree, like our trial by battle, is appealed to by the ignorant natives to declare God's judgment, and the effects which follow the ordeal are considered as proofs of the guilt or innocence of accused persons.

The juice, or a decoction of the wood, is given to the accused to drink, and, if vomiting occurs without being followed by death, the parties are declared innocent; but if they die, they are condemned as guilty.

The irritability of the stomach, or the will of the judge, in reality, is thus the gauge of guilt; for if the fault be slight, or the judge inclined to favour the prisoner, a portion of the bark is given him to chew, which is invariably rejected by the stomach, and the accused escapes; but if the charge be grave, or the judge unfavourable, the decoction of the wood is given, and then the accused has little chance.

In our collections it is called the Red Water-tree, and is treated like other stove plants—that is, grown in a mixture of light turfy loam, sand, and moor-earth, and propagated by young cuttings struck in sand under a hand-glass. Its historical value is all this plant can claim as deserving a place in our collections; for, though a lofty tree in Africa, it is necessarily here a diminutive plant.

To the Editor of the Horticultural Register.

REMARKS ON THE SCIENTIFIC EXAMINATION OF GARDENERS.—
SIR,—Having observed an article in the "Gardener's Magazine" for November, headed "Scientific Examination of Gardeners," I beg leave to submit to you a few remarks on the subject. I beg pardon of the learned writers, from whom I am forced to differ in opinion, and I assure them that it is unwillingly and with regret that I do so; but the very system upon which this examination is conducted is in itself an effectual bar to the good which they expect to follow. The reasons are obvious:—they are examined privately by Dr. Lindley, the assistant secretary, without any of the other members of the Garden Committee, or even the gardener himself, being present; and Dr. Lindley has a discretionary power to decide whether those he examines belong to the first or second class, granting them a certificate accordingly, and in all probability will decide according to the opinion he forms of the man, rather than according to his merits.

I do not mean to say anything against that gentleman's writings, as gardeners, above all others, require the most extensive knowledge; but,

at the same time, they ought never to lose sight of the practical parts of their profession.

It is natural to suppose that when the Doctor gives his students the heads upon which he is to examine them at a future time, (or say when they are ready,) like a boy at school, when he has got his lesson by heart, to intimate to his teacher he has done so—when, as soon as he finds it convenient, he is called forward to repeat it: in that respect, those who can answer the Doctor most correctly at the time, supposing he were quite ignorant of the practical and most necessary parts of a gardener's qualifications, would be classed as a first-rate, and put on a par with others of more extensive, if not superior acquirements.

I submit the before-mentioned facts to you, Mr. Editor, and your numerous readers, whether such a system of examination is calculated to form a new *era* among gardeners, and raise them to a higher scale of being—to be more thought of by their employers, and suitably rewarded for their industry. Such a system, in my opinion, is calculated to degrade the profession; as, for instance, if a young man has got a tolerable education, he may ingeniously contrive to obtain an extra first-rate certificate from Dr. Lindley, and then go forth to the world making a boast that he has passed the Board of the London Horticultural Society, while, at the same time, he may be destitute of any practical knowledge of what he professes; and if placed as head gardener in a situation of importance, of course great things would be expected of him, which he may not be capable of performing, and the consequence will ultimately be that he loses his place; and if a good gardener, who has an experimental and practical knowledge of his business, which he has been pursuing for the course of years, were to succeed him, he would be treated with indifference, and in all probability find his salary reduced to that of his predecessor, which he can only recover by attention.

I should like to see some system adopted which might be the means, if possible, of keeping back pretenders and those spurious gardeners who are daily springing up amongst us as noxious weeds; and I would, therefore, propose to the Horticultural Society, and those who are interested in its affairs, that their regulations as to receiving men into the garden be observed in all time coming; and that when two or more are to be examined—a day being previously fixed on for that purpose—at least five or six practical gardeners most convenient to the neighbourhood, and who are considered to be men of respectable conduct and acquirements, be summoned to attend there as a jury—also the gardener of the establishment and the foremen of the respective departments; and when so assembled, let Dr. Lindley proceed to examine the candi-

dates, one after the other, on the various branches of their profession, both in theory and practice, and let the jury give their opinion whether those who are examined, or any of them, shall be entitled to a certificate of the first or second class, or sent back to pursue some other course of employment for which they are better adapted by nature.

It would be encroaching on the pages of your valuable work to mention all the qualifications which a gardener ought to possess; therefore I would only say to the young and inexperienced, endeavour by every possible means to obtain a knowledge of the vegetable kingdom, from the lofty tree to the diminutive weed of the garden, as in these days, in which we enjoy commercial intercourse with the uttermost ends of the earth, and have made all the valuable produce of other places our own, both for ornament and use, the business and duties of a gardener are very much extended.

To be a good gardener, a man not only requires a preliminary education, but a steady perseverance in acquiring knowledge and habits of industry, and a taste for comforts; and I am glad to say, that for this purpose a gardeners' society has lately been established at the west of London, called "The West London Gardeners' Association for mutual Instruction and Improvement." I understand they have taken a school-room at Hammersmith sufficient to accommodate eighty individuals. I have had the pleasure of attending one of their meetings, and, from the respectable individuals who attend, and the manner in which it is conducted, I have no doubt but it will ultimately be of great utility to gardeners and society at large.

I should be glad to see some person better qualified than myself take up this subject, and remain, &c.

Turnham Green, 14th November, 1836.

ALEX. RUSSELL.

NOTICE OF JOHNSON'S KITCHEN GARDEN.

THE KITCHEN GARDEN; its Arrangement and Cultivation. By George W. Johnson, author of "The History of English Gardening," &c. Orr and Smith, Paternoster Row.

This little work has lately come under our notice; it has no pretensions to originality, the author being, as he himself modestly states, "almost exclusively a retailer of other men's wares." As a compilation, however, it is very respectably got up, the various matters being well selected; and it is arranged with considerable judgment, besides being written in a very pleasing style. The principal source whence the author has drawn information is from the "Transactions of the Horticultural Society of London," and from several other contemporary publications. It is certainly a very neat and cheap compendium of kitchen gardening.

NOTICES OF BOTANICAL PUBLICATIONS.

EDWARDS'S BOTANICAL REGISTER, continued by Professor Lindley.
The November number contains:—

1. *Ionopsis tenera*. A very delicate and pretty flowering genus, belonging to *Orchidaceæ*. Its different species are but little known in consequence of the difficulty of bringing them from their native country, and of growing them well when brought. In their native woods they grow upon the smaller branches of trees, or upon dead sticks, which their white slender roots quickly overspread. Dr. L. enumerates four species which have been pretty clearly described, viz. *I. pulchella* and *testiculata*, Sir William Hooker's *Iantha pallidiflora*; the third is the one represented, and the fourth is a very remarkable species, having purple-panniced scapes, a foot and a half long, bending gracefully beneath the weight of the delicate snow-white flowers. A French author mentions a variety of it with flowers of a delicate rose-colour, which flowers from September to March, continuing all the intervening period without fading.

The present plant flowered in the collection of Sir Charles Lemon, at Carclew, in May last, and is described by Mr. Booth.

2. *Rondeletia odorata*. An hexandrious plant, belonging to the natural order *Cinchonaceæ*. It is a handsome-flowering stove exotic, found by Jacquin on bush-covered rocks near the sea in the Havannah. He says the bright vermilion-coloured flowers are as sweet-scented as violets; hence the specific name. This fine scent, however, is not evolved by cultivated plants. It thrives in a mixture of loam and moor-earth, and cuttings root in sand under glass. In collections it is usually known as the *R. speciosa*.

3. *Epimedium macranthum*. Large-flowered Epimedium. A very pretty sweet-scented species, remarkable for the large size of its pale violet flowers. "It has been amply described by Messrs. Morren and Decaisne from plants that flowered in the garden of the University of Ghent, where it forms one out of a hundred and sixty species of Japanese plants brought to Europe alive by Dr. Von Siebolt. This is by far the most considerable importation from Japan that has yet been made, and its results have been so satisfactory as to lead us to hope that the Dutch botanists may be the means of bringing us acquainted with a larger portion of the beautiful plants which adorn that most singular country."

The drawing was taken from a plant which flowered in the nursery of the Messrs. Osborne, at Fulham, in April last, and is well worth the

notice of the curious in plants. It is quite hardy, bears tetrandrous odd-shaped flowers, and belongs to *Berberaceæ*. Two other species are in the Ghent collection. Doubts are expressed whether or not the *E. alpinum* be a wild British plant: of this we think British botanists can have no kind of doubt.

4. *Aspasia variegata*. Variegated Aspasia. A new species of an orchideous genus, introduced by Mr. J. Knight, of the King's Road, Chelsea. The flowers are deliciously sweet in the morning, and are beautifully variegated with white, yellow, green, and purple, for which it deserves a place in every stove collection.

5. *Craspedia glauca*. Glaucous Craspedia. A herbaceous plant belonging to *Compositæ*, found in Van Diemen's Land, whence it was sent by Mr. James Backhouse to his brother, in whose nursery at York it flowered in April last. It is probable that it will only require the protection of a cold frame in our winter.

6. *Clintonia pulchella*. Pretty Clintonia. A very elegant little plant belonging to *Lobeliaceæ*, which Dr. Lindley says he is more desirous of recording the existence of, lest it should be lost, than for its importance as a flower-garden plant. It only exists in the garden of the Horticultural Society, and is preserved from year to year with much difficulty, as it ripens but few seeds. In its appearance it much resembles a small three-coloured violet. It is one of the *Flora Douglasii*.

7. *Cratægus Mexicana*. Mexican Hawthorn. An icosandrous plant, and, like its congeners, belonging to *Rosaceæ*. It is a native of the Tierra Fria of Mexico; a small tree, and in mild climates is quite evergreen. It requires a sheltered place in this country, and is easily propagated by grafting on the common hawthorn. The haws are large, and held in some estimation in Mexico, but are not superior to other haws in this country.

8. *Oncidium iridifolium*. Iris-leaved or Pigmy Oncidium. A curious little species of Oncidium, native of South America, found growing exclusively upon the branches of orange and lemon trees. It is plentiful in the neighbourhood of Bom Jesus de Bananal, in the province of St. Paul, Brazil, and constantly prefers *dry places exposed to the sun*—a situation of all others the most unsuitable for the trees, as well as to the generality of orchideous epiphytes. The plant figured flowered at Wentworth House.

SWEET'S BRITISH FLOWER GARDEN, continued by Professor Don. The number for November contains:—

1. *Bartonia aurea*. Golden Bartonia. An herbaceous plant, dis-

covered and introduced by Douglas from California, bearing large yellow polyandrous flowers, and belonging to the natural order *Loaseæ*. The plant loves a rich soil, and should be treated as a tender annual—that is, raised from seeds in a frame, and removed to the open border about the middle of May.

2. *Mimulus cardinalis*. Scarlet Monkey-flower. This and all the other *Mimuluses* belong to the order *Scrophularineæ*. This is another of Douglas's acquisitions, and, although but recently introduced, it has already become pretty. It appears to be little more than annual, growing freely and seeding plentifully in any common soil, and flowering from June to October; it is propagated by cuttings as well as seeds.

3. *Iberis coronaria*. Rocket Candy-Tuft. A plant belonging to *Cruciferae*. It is by far the most showy of the genus. It is a hardy annual, of easy culture, growing freely in the flower-borders. At a distance, the plant bears a considerable resemblance to the double White Rocket.

4. *Phacelia tanacetifolia*. Tansy-leaved Phacelia. A hardy annual from California, and belonging to *Hydrophyllææ*. The plant is one of those that is likely to possess greater interest in the eyes of a botanist than of the mere admirer of showy flowers; for, though in the early stage of its flowering it is not wanting in beauty, it afterwards assumes a weedy aspect by no means attractive. This, as well as the preceding, were drawn from plants in the nursery of Messrs. Allen and Rogers, at Battersea.

PAXTON'S MAGAZINE OF BOTANY. The November number contains:—

1. *Clerodendrum speciosissimum*. Beautiful Scarlet-flowering Clerodendrum. "This is one of the finest plants," says Mr. Paxton, "we have had the good fortune to figure; it is far superior in beauty to any of the fine family to which it belongs. The colours are so brilliant, that the representation here made falls considerably short of doing it justice; indeed it is beyond the reach of the artist to give a faithful likeness of its colours." It is further stated that the plant was received from Belgium last year by Messrs. Leucombe, Pince, and Co., of the Exeter Nursery, and flowered with them in August and September last. It is easily grown and propagated either by young cuttings or pieces of the roots.

2. *Leptosiphon Androsaceus*. Androsan-like Leptosiphon. A pretty annual, a native of California, whence it was introduced to our collections about three years ago by the late Mr. Douglas. It thrives in any kind of soil, and, in point of situation, a partial shade suits it best. Its

heads of pale purple pentandrous flowers and deeply-cut leaves are ornamental, but it does not yield seed freely : some care is requisite in preserving good seed. It belongs to the order *Polmoniaceæ*.

3. *Sarracenia purpurea*. Purple Side-saddle Flower. A singular yet handsome plant, found inhabiting the swamps of North America. The flowers are polyandrous, and it gives a title to the order to which it belongs, viz. *Sarracenaceæ*. This plant does not thrive in the open air in this country, though a native of a more northern region ; they are found to do best in a shady frame, or in a stove planted in pots filled with pieces of peat at the bottom, and sphagnum or water-moss at the top, and the pots placed in pans of water. They also do very well in moss, without pots, in a frame ; but either way they must be kept rather moist and quite shaded.

To these figures and descriptions Mr. Paxton has added five essays on subjects interesting to gardeners, namely, first, "An Essay on the Climate of Hothouses," from the pen of Professor Daniell, of the King's College, London ; second, "Hints on the common Garden Balsam ;" third, "Scientific Principles of Grafting," from "The Alphabet of Gardening ;" fourth, "Remarks on the Genus *Nerium* ;" and, fifth, "On the Science of Botany." There is also an account of new plants, and a calendar of operations for November.

CALENDARIAL MEMORANDA FOR DECEMBER.

KITCHEN GARDEN.—Protecting the growing and stored crops from the severity of the weather is a daily task in this dead season of the year ; it is also a month of preparation for the execution of subsequent business. Manuring, trenching vacant pieces of ground, collecting and turning composts, preparing dung for hotbeds, &c., are all the ordinary employments of the month.

If the weather be open, and the soil pretty dry, other sowings of early sorts of peas and beans may be put in. This is particularly necessary if the former sowings have been cut off, or to succeed them if they be not.

Mushroom beds will require frequent examination : whether in bearing or not, more or less covering may be needed, according to the temperature of the bed itself as well as of the atmosphere.

Cauliflower, lettuce, endive, &c., in frames, should be closely attended to. Full air should be given on every favourable occasion,

and the plants kept free from weeds, decayed leaves, and damp. Covering with mats will be necessary in severe weather. Asparagus, sea-kale, and rhubarb, intended to be taken up for forcing, should be covered with litter to keep off frost.

The ice-house may probably be filled in this month, for which all necessary preparations should be made to get through the labour, if possible, in one day.

FRUIT GARDEN.—Transplanting in mild weather, and pruning and training, may be proceeded with; and, where top-dressings of either rotten dung or compost are required, they should now be put on.

FLOWER GARDEN.—There is but little to do in the flower garden at this season. If very hard frost sets in, some of the beds planted in the two preceding months may require an occasional covering of mats; and everything liable to injury from frost should have some kind of protection. A few more pots of bulbous and tuberous flowers may be planted, to go into the house to succeed those planted in October. Greenhouse plants should have all the fresh air which can be given with safety. If any of them are growing freely, they will require watering frequently; but those that are dormant or stationary, very seldom. If the house become damp for want of sufficient ventilation, the flue should be heated, and plenty of mild air admitted to dry it. It is hardly necessary to add, that, if frost prevail, a little fire will be wanted every night, but never more than is just sufficient to keep out the frost.

COTTAGE ECONOMY.

DECEMBER.

Bees.—The less the bees are examined this month the better; therefore nothing should be attempted which has a tendency to diminish the temperature of the hives.

Work to be done in the Garden.—The weather is generally too wet and uncertain this month for doing much in the garden; it is more for thought and reflection than for labour. The cottager should now resolve on his plans for next year's operations, and, having ascertained the vegetables most useful to himself and family, and most suitable for his soil and situation, he ought to make preparations accordingly.

REMARKS ON THE WEATHER.

Few of us can remember a more inclement autumn than has been lately experienced. Extremely keen frost set in at the end of October, though, luckily for those whose potatoes were still in the ground, it did not continue. The leaves of both pear and apple trees were killed, and many still remain on the branches as if they had been severed from the tree. This is a circumstance which but rarely occurs in this country, the leaves being usually shed before frost sets in to kill them on the tree.

If frost has been thus so severely felt in the southern parts of the island, how much more intensely must it have been felt in the northern, both in gardens and fields, where, in the latter, the corn was yet green? So distressing are the accounts from the northern extremities of the three kingdoms, that a very sensible impression has been made on the London markets, lest the supplies of grain from those quarters should be deficient. A similar calamity has happened, it seems, in the United States of America, but from what cause is not said; and already many cargoes, drawn from the granaries of London and Liverpool, where they have been long bonded, are now on their way across the Atlantic.

Such visitations are not unfrequent in our changeable climate, and, were they only productive of loss and disappointment, sudden changes would be serious evils; but they teach the gardener especially an useful lesson—they arm him with precaution for the future, show him which are the hardest of his various products, and how the more tender may be kept in safety.

November 25th, 1836.

A LIST OF NEW AND RARE PLANTS

NOTICED IN VOL. V.

Acacia vestita
Adesmia pendula
Agrostemma Bungeana
Allium Siculum
Alstroemeria aurantiaca
Angræcum caudatum
Antirrhinum glandulosum
Aptorium depressum
Ardisia odontophylla
Aristolochia trilobata
 — *fœtans*
Azalea Rawsonia

Bartonia aurea
Berberis empetrifolia
Begonia platanifolia
Bifrenaria aurantiaca
Brunonia Australis

Calceolaria Hopeana
Camellia Jap. Doncklearii
 — *candidissima*
 — *reticulata*
Calliopsis bicolor atrosanguinea
 — *Drummondii*
Cattleya labiata
Celosia coccinea
Centaurea balsamita
Chironia trinervis
Cirrheæ tristis
Clematis calycina
Coccaloba virens
Collinsia bicolor
Cooperia Drummondii
Corysanthes macrantha
Cratægus crus galli
 — *Aronia*
 — *heterophylla*
 — *microcarpa*
 — *Moroccana*
 — *odoratissima*
 — *Orientalis*
 — *platyphylla*
 — *pyrifolia*
 — *spatulata*
 — *tanacetifolia*
Crocus suaveolens
Cytisus Æolicus

Daphne odorata
Dendrobium densiflorum
 — *macrostachyum*
 — *moniliforme*
 — *moschatum*
Dichorizandra thyrsiflora
Douglasia nivalis
Dryandra longifolia

Elichrysum bicolor
Epidendron æmulum
 — *bifidum*
 — *Skinneri*
Erythrina crista-galli
Escallonia illinita
Eschscholtzia crocea
Eulophia lurida
Eutoca Menziesii

Fritillaria Ruthenica
Fuchsia Groomiana

Galatella punctata
Gillia tenuiflora
Gadiolus Natalensis
Godesia lepida
 — *rubicunda*
 — *vinosa*

Habenaria procera
Heliconia Brasiliensis
Hibiscus rosa Sinensis

Illicium Floridanum
Ipomœa Horsfallia
 — *rubra-cœrulea*
Iris alata
 — *spuria*
Ismelia Madeirensis
Ixora Bandhuca
 — *grandiflora*

Kageneckia cratægifolia
Kalosanthos splendens
Kennedya glabrata
 — *macrophylla*
 — *Stirlingia*
Kerria Japonica

Lapeyrousia anceps
Lasiopus sonchoides
Lasthenia Californica
Lathyrus Magellanicus
 ——— rotundifolia
Lobelia decurrens
Lupinus bimaculatus
 ——— latifolius
 ——— macrophyllus
Lycium Afrum
Lychnis Bungeana

Macradenia triandra
Manettia cordifolia
Mandragora autumnalis
Maxillaria Deppei
 ——— rufescens
Mimulus Cardinalis
 ——— Wheelerii
Mormodes atropurpurea
Musa Cavendishii
Myanthus deltoides

Narcissus conspicua
Nemophila aurita
 ——— insignis
Nerium thyrsoiflorum
Nierembergia calycina
 ——— phœnicea

Oenante arguta
Oenothera humifusa
Oncidium altissimum
 ——— divaricatum
 ——— Lanceanum
 ——— Russellianum
Orithya uniflora
Ornithogallum chloroleucrum
Oxalis Piottæ
Oxyure chrysanthemoides

Pæonia albiflora
 ——— tenuifolia
Pentstemon Cobeæ

Pentstemon heterophyllum
Phacelia congesta
 ——— vinifolia
Phlox Drummondii
Pimellia ligustrina
Pleurothallis picta
Poinciana pulcherrima

Rhodanthe Manglesii
Rhodochiton volubile
Rhododendron arboreum
 ——— arboreum undulatum
 ——— campanulatum
 ——— chamæcistus
 ——— flavum
 ——— pulcherrimum
Ribes malvaceum
Rondeletia speciosa
Rosa lutea, var. pleno

Sarcophilus falcatus
Saracha viscosa
Scaphyglottis violacea
Scilla cupaniana
Silene regio
Solanum crispum
Stanhopea insignis

Tricophilla tortilis
Trifolium fuscatum
Tristania macrophylla

Verbena erinoides
 ——— Lamberti
 ——— Melindres
 ——— rugosa

Yucca draconis
 ——— flaccida

Zenobia speciosa
Zephyranthes Drummondii
Zygopetalon cochleare
 ——— Mackaii

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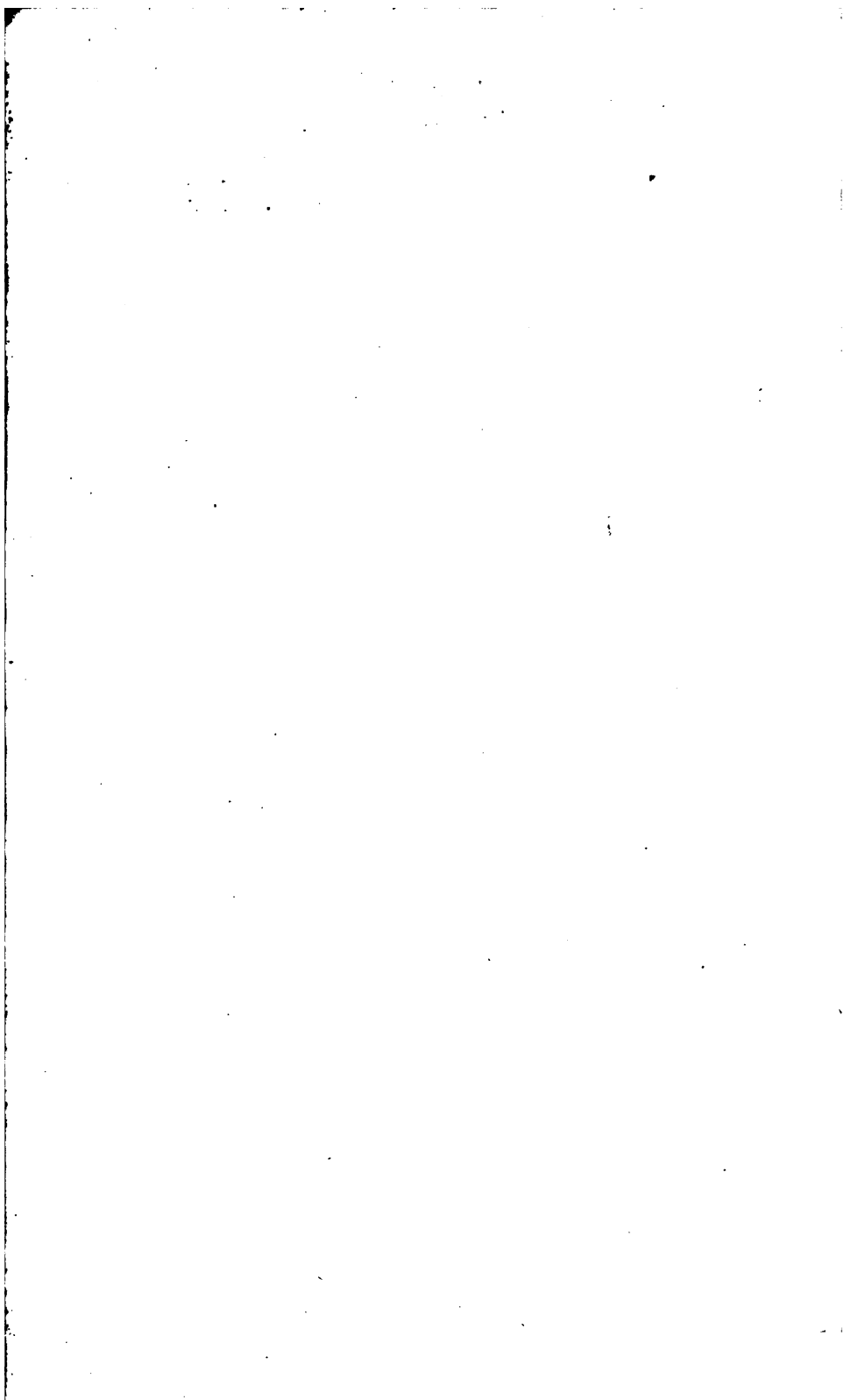
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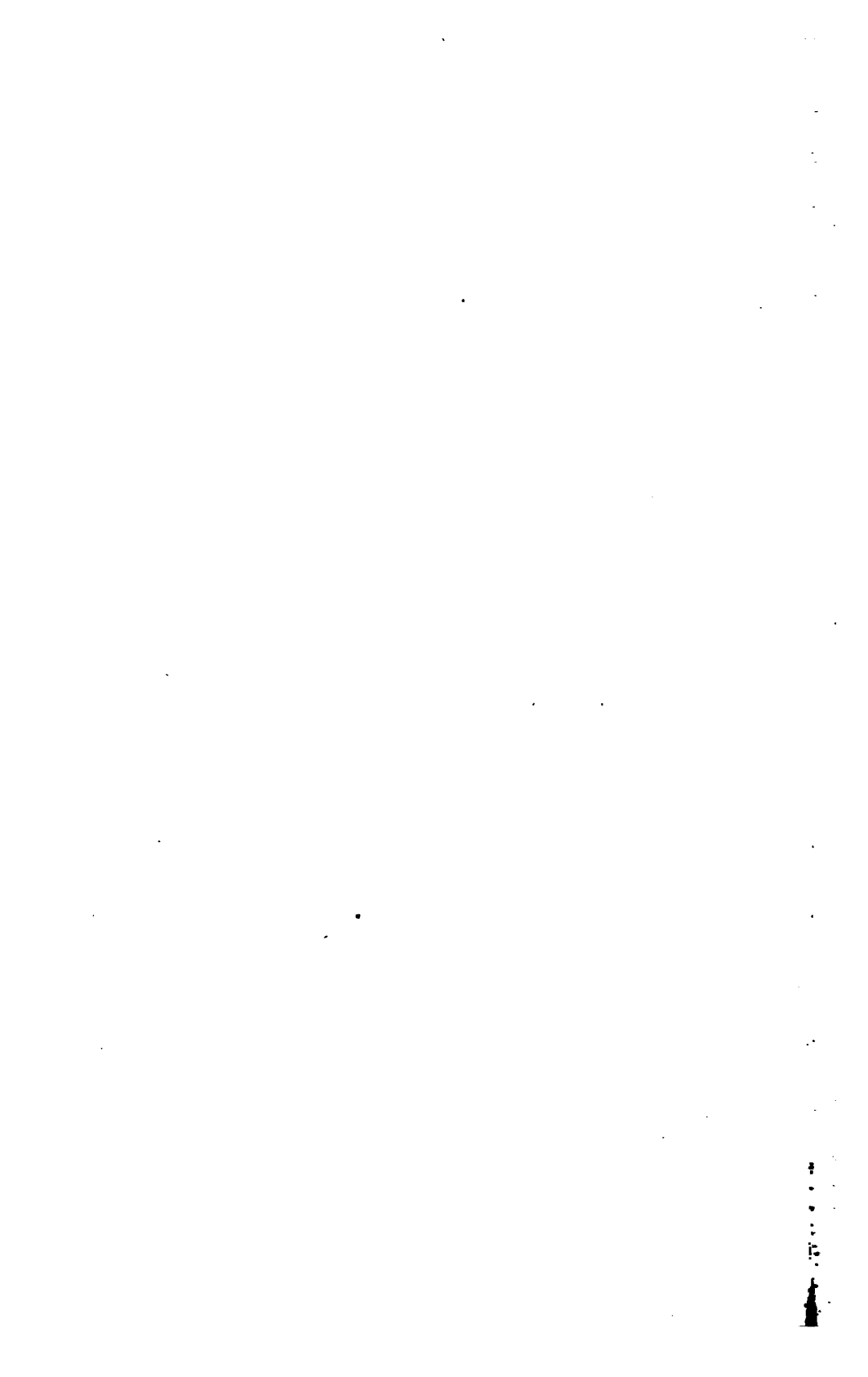
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